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APPENDIX TO THE JOURNALS

OF THE

SENATE AND ASSEMBLY

OF THE

TWENTY-FOURTH SESSION

OF THE

LEGISLATURE OF THE STATE OF CALIFORNIA.

Volume III.

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REPORT

OF THE

STATE BOARD OF EQUALIZATION

FOR 1880.

STATE BOARD OF EQUALIZATION.

WARREN DUTTON, Chairman.

JAMES L. KING,
T. D. HEISKELL,
M. M. DREW,
D. M. KENFIELD, Ex Officio.

E. W. MASLIN, Secretary.

SACRAMENTO:
STATE OFFICE : : : J. D. YOUNG, SUPT. STATE PRINTING.
1880.

REPORT.

Office of the State Board of Equalization,
Sacramento, November 1st, 1880.

To his Excellency Geo. C. Perkins, *Governor of California:*

The State Board of Equalization herewith submit to your Excellency the following report:

The statements particularly required by the Political Code to be reported, as well as others which are deemed enough of public interest to prepare, are contained in the several schedules hereto annexed:

Schedule A is a summarized statement of the reports of the Auditors, showing total value of all property upon which the State tax was levied for 1880. The true value is stated in Schedule O.

Schedule B shows the amounts to be raised for State purposes, and rate of State tax for the 32d fiscal year.

Schedule C shows the amount of rolling stock owned by railroad companies assessed by this Board.

Schedule D shows the assessed value *per mile* of roadway, etc., rolling stock, and franchises of such railroad companies.

Schedule E shows the assessed value of the roadway, etc., rolling stock, and franchises owned by said companies.

Schedule F shows the apportionment of the assessment of said property of each company to the counties entitled thereto.

Schedule G shows the total amount apportioned to each county.

Schedule H shows, from Assessors' reports, the value of railroads assessed by Assessors.

Schedule I shows, from Assessors' reports, the amount of solvent credits assessed, and the per cent. the amount is of personal property.

Schedule J shows the assessed value of franchises and shares of capital stock.

Schedule K shows the value of the property in two counties subject to one mortgage, the value of the mortgages, and the per cent. the amount of the mortgage is of the value of the property mortgaged.

Schedule L shows the number of mortgages in the State, value of mortgages, value of all the real estate and improvements, and per cent. the value of mortgages is of such real estate and improvements.

Schedule M shows number of acres of land assessed, and average value per acre in 1879 and 1880.

Schedule N shows value of real estate, city lots, and improvements thereon.

Schedule O shows value of each class of property assessed, and total value of all property.

Schedule P shows the increase of assessed value over previous year.

Schedule R shows which class of property was increased in value.

Schedule S shows the number of tracts of land of certain acreage, and average value per acre of each class.

Schedule T is a summarized statement of the reports of Assessors of several counties, showing in detail the kind of personal property assessed, and value thereof.

Schedule V shows from same reports the agricultural products for 1879.

Schedule W is of like character for 1880.

The Rules and Regulations of the Board will be found marked "Appendix" at the end of this report.

RATE OF STATE TAX EIGHTEEN HUNDRED AND SEVENTY-NINE.

The State tax for the year 1879 was 62½ cents on each $100 valuation.
The amount to be raised was:

For the General Fund	$1,450,000 00
For the School Fund	1,250,000 00
For the Interest and Sinking Fund	315,000 00
Total	$3,015,000 00

The assessed valuation of all property in the State in the year 1879 was $547,622,769.

EIGHTEEN HUNDRED AND EIGHTY.

The State tax for the year 1880 is 64 cents on each $100 valuation.
The amount to be raised is:

For the General Fund	$1,750,000 00
For the School Fund	1,400,000 00
For the Interest and Sinking Fund	315,000 00
Total	$3,465,000 00

The assessed value of all property in the State in 1880, as reported on the third Monday in August by the County Auditors of the State, was $666,183,320.

Upon this sum, after allowing, as provided in Section 3696, Political Code, 12 per cent. for delinquencies in and costs of collection of taxes, the Board fixed and determined the rate of the State tax to be 59 cents on each $100 of valuation.

The Legislature by the Act approved April 23, 1880, entitled "An Act to promote drainage," levied upon the taxable property of the State, for the "State Drainage and Construction Fund," a tax of 5 cents on each $100 of valuation, which, added to the 59 cents levied by this Board, makes the total State tax 64 cents.

Schedule A shows total value of the property of the State, and Schedule B shows how the tax is apportioned to the different funds.

After the Board levied the tax, a number of the Auditors of the State discovered some errors in the footings of the columns of the assessment books, which were rectified in subsequent reports, and which rectification increased the assessable property $19,352.

Schedule N and O show the true and correct values; all the other tables, estimates, and calculations are based on Schedules N and O.

The following shows the correct value of property in the State, the assessed value in 1879, and the increase in value this year:

Assessed value in 1880	$666,202,674 00
Assessed value in 1879	547,622,769 00
Increased in assessment	$118,579,905 00

By the provisions of the Code, the Assessors are to begin assessing on the first Monday in March. The Act conforming the revenue system to the Constitution was not approved until the 22d March, 1880, and its provisions were not known to the Assessors until the middle of April, so that the assessment of the State was performed within two and a half months. Had the Assessors been able to begin their labors on the first Monday in March, there can scarcely be a doubt that much more property would have been discovered and assessed.

It may be well at this point to state that the additional duties imposed by the Constitution and the law, in respect to the assessment of mortgages, and the subdivision of tracts of land, for the purposes of assessment, into tracts of 640 acres and less, entailed double labor upon Assessors. This additional labor, coupled with the diminished time for completing the assessment, necessitated the employment by a number of Assessors of more deputies than it was usual in former years to employ. Where the Assessor received a salary, the increased expense for deputies materially decreased the Assessor's compensation, and, in one instance, we are informed, totally deprived the Assessor of any recompense for this year's labor.

We have attempted, in a number of instances, to remedy the injustice by exercising the power given us by Section 3704, Political Code. This section provides that, if the Board of Supervisors of any county fails to allow the Assessor a sufficient number of deputies to make the assessment, then the State Board of Equalization may make the allowance, and the Controller must, in his next settlement with the County Treasurer of such county, require the Treasurer to pay the amount out of any funds belonging to such county.

In some cases, where the Board has allowed Assessors extra deputies, the Boards of Supervisors have refused to audit the claims of the Assessors, and the Treasurers have disregarded the orders of the Controller.

This section seems to be predicated upon the supposition that, in the settlement with the Controller, the county receives from the State certain funds belonging to the county. The vice of the section is, that the Controller has neither any control over county funds, nor power to enforce his order.

If it is desired that this Board shall have the power intended to be conferred by Section 3704, it should be so amended as to direct the Board of Supervisors to audit the claim of the Assessor, and the County Treasurer to pay the same out of the General Fund of the county, upon the warrant of the County Auditor.

ORGANIZATION OF BOARD.

As before stated, the Act amending the sections of the Code relating to revenue was not approved until March 22d, so that up to that time the Board was powerless to perform any duty, further than to be in attendance at Sacramento, and to consult with various members of the Legislature in reference to the subject of revenue.

After the passage of the law aforesaid, the Board passed certain rules and regulations for the government of Assessors and of Supervisors sitting as Boards of Equalization. These rules, with a copy of the revenue law, were bound in pamphlet form, and were distributed to the various county officers in the State. A copy of the rules is found in the Appendix to this report.

On the 8th of April, 1880, the Board elected Warren Dutton as its Chairman, and on the 13th elected E. W. Maslin as its Secretary.

From the 1st of April until the 2d of June, the Board held a session each day, finding constant duties to perform.

Nearly every Assessor found himself in a strait as to the mode, manner, and rule of assessing those things which, before the Constitution, had not been considered property subject to assessment, *i. e.* mortgages, franchises, shares of capital stock, solvent credits, etc., and the labors of the Board were largely devoted to instructing, by letter and by rule, the various Assessors in their duties, and in impressing upon them the necessity of having one uniform standard of value throughout the State, namely "full cash value."

ASSESSMENT OF RAILROADS.

Section 3664, Political Code, provides that: "On or before the first Monday in May, in each year, the State Board of Equalization shall assess the franchise, roadway, roadbed, rails, and rolling stock of railroads operated in more than one county," and further, that certain officers of any corporation operating any such railway shall furnish this Board, on or before the first Monday of April in each year, a statement showing certain facts concerning such road for the year ending on the first Monday in March of such year.

The following are the names of companies which operate roads in more than one county:

Amador Branch,
California Pacific,
Central Pacific,
Northern Railway,
Sacramento and Placerville,
San Pablo and Tulare,
Southern Pacific,
Stockton and Copperopolis,
California Northern,
San Francisco and North Pacific,
Vaca Valley and Clear Lake,
Nevada County Narrow Gauge,
North Pacific Coast,
Santa Cruz,
South Pacific Coast.

All of said companies, with the exception of the San Francisco and North Pacific Company, filed their statements in pursuance of law.

On the 28th of April, the companies named in the left column appeared, by their agent, E. B. Ryan, and their attorney, T. B. McFarland, and offered testimony, which was received, in respect to the value of their properties.

Argument was also had in respect to what constitutes the franchise of a railroad, and whether it was properly assessable.

On the 30th of April, the Board, being fully advised in the premises, proceeded to and did assess the franchise, roadway, roadbed, rails, and rolling stock of each of said companies.

The total valuation is as follows:

Roadways	$21,262,662 50
Rolling stock	6,506,256 00
Franchises	3,405,222 71
Total	$31,174,141 21

On May the 13th the Board transmitted to the County Assessor of each county through which the railways of each of said companies run, a statement "showing the length of the main track of such railway within the county, and the assessed value per mile of the same, as fixed by the pro rata distribution per mile of the assessed value of the whole property of the company."

Schedule D shows the value *per mile* of the roadway, etc., rolling stock, and franchise of each railroad.

Schedule E shows separately the value of the roadway, etc., rolling stock, and franchise of each railroad.

Schedule F shows the apportionment of the assessed value of each railroad to each county entitled thereto.

Schedule G shows the apportionment to each county.

The Stockton and Copperopolis, San Pablo and Tulare, Northern Railway, Amador Branch, and California Pacific Railroads are operated under lease by the Central Pacific Railroad Company.

Of the 711.56 miles of the railroad owned by the Southern Pacific Railroad Company, 160.89 miles are operated by said company, and 550.67 miles are operated by the lessee, the Central Pacific Railroad Company.

Attention is called to the question which may arise in respect to the proper assessment by this Board of railroads operated by other than their owners; that is to say, shall the property be listed to the corporation owning the property, or to the lessee operating the same?

There is a want of precision in Section 3664 on this question. Arguing from the fact that the section provides that the President of a corporation *operating* a railroad in more than one county shall make a statement; and further, that such statement shall show the number of miles operated and *leased* by the corporation making the return, and the number of engines and cars, etc., used in operating the railway, it would seem that the section contemplated that the property should be listed to the corporation operating it, were it not that in another part it provides that if the said President or other officers fail to make such statement, the Board of Equalization shall proceed to assess the property of the corporation so failing.

Arguing from the general proposition, that the owner of property is primarily liable for the taxes thereon, the Board assessed the railroads above named, respectively, to the owners thereof.

The section should be amended so as to put the question beyond a doubt.

Again, the section directs that "the Board shall transmit to the County Assessor of each county through which any railway operated in more than one county may run, a statement showing the length of the main track of such railway within the county, and the assessed value per mile of the same, as fixed by a pro rata distribution per mile of the assessed value of the whole property named in this section."

If this provision is literally followed, the bald statement would be something like this: In the County of San Francisco, Central Pacific Railroad; length of main track, four miles, at $20,264 per mile. But we are met by a provision of Section 3650, which requires that "each franchise must be entered on the assessment roll without combining the same with other property, or the valuation thereof."

A literal compliance with Section 3664 would prevent the Assessor from complying with the provision of Section 3650 in respect to the listing of the franchises of the railroads.

The Board overcame the difficulty by the form of the statement to the Assessor which was adopted, but it is evident that in the matter of the form and mode of assessment of property, nothing should be left to the judgment of any officer.

These sections should be amended so as to harmonize, and prevent hereafter a doubt as to the legality, both of the form of the statement by the Board in respect to franchises, and of the manner in which the statement is put upon the assessment book by the Assessor.

AN ERROR TO BE RECTIFIED.

The Southern Pacific Railroad Company, in its statement to this Board, reported that the length of the entire roadway in this State was 711.56 miles; of which 48.88 miles lay in San Bernardino County, and 164.57 miles lay in San Diego County.

The total valuation per mile being $14,733 15, the Board apportioned the amount due those two counties, as follows:

To San Bernardino	$720,156 21
To San Diego	2,424,633 98

After the apportionment had been made, the County of San Bernardino employed Mr. Fred. T. Perris, United States Deputy Surveyor, to survey so much of the route of the Southern Pacific Railroad Company as lay in that county. He found, according to his report, that, instead of 48.88 miles only, 54.6 miles of road lay within the county lines of San Bernardino County.

In his report to this Board, which accompanied a petition from the Supervisors of said county to make a new apportionment, he writes as follows:

> The present apportionment of 48.88 miles of the county was undoubtedly obtained from the Southern Pacific Railroad map of the line, as it shows the entrance of the road into San Bernardino County at sta. 2.900, and its exit at sta. 5480+60 (W. of the meridian), which gives 48.875 miles, or converting thousandths, 48.88 miles.
>
> This intersection, as given on the railroad company's map, I have shown in blue on the accompanying tracing.
>
> It will be seen, from an examination of the field notes and map of the boundary line, that instead of the boundary crossing the railroad at the point indicated on the maps of the company, it crosses at a point east of Banning, described as being 266.45 chains N., 84° 12′ E. of the meridian, which point corresponds with sta. 5664+77 of the railroad survey, a fact I have ascertained by actual survey.
>
> From this point the road runs in San Diego County to 341 chains or sta. 5714+28 of railroad survey, when by a tangent and curve to the north it reënters San Bernardino County, and continues there until its final exit at 514 chains of survey of county boundary line and sta. 5832+84 of railroad survey, and near E. C. 712 R. and sta. 5833+50. (See notes of boundary line.)
>
> In other words, from sta. 2.900, entrance of road to this county, to sta. 5664+77, where it first enters San Diego County, equals 2764+77 stations or 52.36 miles. To this add the length of the tangent and curve from sta. 5714+28 to sta. 5832+84, which is 2.24 miles, and we have an aggregate of 54.6 miles of road in this county.
>
> It must be borne in mind that at the time the railroad survey was made the county line had not been defined. Since that time the line has been marked on the ground by order of the State Surveyor-General, and the Board of Supervisors of San Diego has since accepted the survey.

This Board is of the opinion that a mistake has been made which ought to be rectified. The Board was appealed to by the Supervisors of San Bernardino to reapportion the assessment of the Southern Pacific, but it was apprehensive that, under the law, it had no power to do so. Section 3664 provides that on or before the first Monday in May the Board shall assess such railroads as are operated in more than one county, and therefore it was feared that to exercise the power to reassess the S. P. R. R., after such date, would, in all probability, subject the whole assessment of the railroad to litigation.

If the position of the County of San Bernardino is correct, of which there is scarcely a doubt, the assessment of the S. P. R. R., so far as the two counties are affected, ought to have been:

To San Bernardino, 54.60 miles	$804,429 82
To San Diego, 158.85 miles	2,304,360 37

San Diego has received an assessment of $84,273 61 more than should have been apportioned to it.

It remains for the Legislature to adjust the difference between the two counties; possibly, either by the passage of an Act directing San Diego County to pay to San Bernardino the amount of taxes collected upon $84,273 61, or, if it be *constitutional*, by an Act directing this Board in the year 1881, for that year only, to deduct from the assessment of San Diego County the said sum, and to add it to the assessment of San Bernardino County.

The field notes and survey of Mr. Perris are on file in this office for the use of the Legislature.

VISIT TO THE COUNTIES.

According to Section 3692 of the Political Code, it is the duty of the Board "to visit, as a Board, or by the individual members, whenever deemed necessary, the several counties of the State, for the purpose of inspecting the property, and learning the value thereof."

In pursuance of such duty, between the 2d of June and 19th of August of the current year, the Board visited all of the counties of the State, except the Counties of Alpine, Calaveras, Del Norte, Humboldt, Inyo, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Plumas, Sierra, Siskiyou, and Trinity. Want of time alone prevented a visit to the excepted counties.

The Board examined the records of the counties visited, to ascertain the prices at which real estate, both farming lands and town lots, had changed hands; the members of the Board talked with real estate dealers, farmers, and other citizens of each county, in respect to the present and prospective value, and the buying and selling price of land in the county.

The Board examined the assessment book of each county visited, and compared the assessed value of lands with the prices at which the same lands were known to have changed hands about the first of March of the current year. It also examined the Assessor, or his deputy when he could not be found, and ascertained at what percentage of "full cash value," as the meaning of the term was understood by the Board, the Assessor was assessing both real and personal property. Many of the Assessors assured the Board that they had assessed and were assessing at "full cash value," as they understood the term; other Assessors had no very clear idea of what the term meant; and on the whole there were almost as many opinions as to the meaning of cash value as there were Assessors. We shall refer to this subject hereafter.

EFFORT TO EQUALIZE.

Upon the return of the Board to Sacramento, the Board came to the conclusion that in certain counties, the real estate other than city and town lots, and sheep, has been assessed below "full cash value," and that it was the duty of the Board to investigate such cases, and to notify the Boards of Supervisors and the citizens of the counties to be affected by the action of the Board, of the intention of the Board to hear testimony in respect to the propriety of adding a percentage to the value of said classes of property.

The following shows the percentage which it was proposed should be added to the assessed value of real estate other than city and town lots, and of sheep:

County.	Per Cent. on—		County.	Per Cent. on—	
	Real Estate.	Sheep.		Real Estate.	Sheep.
Amador	50	--------	San Joaquin	--------	10
Butte	10	--------	San Luis Obispo	10	--------
Colusa	10	--------	San Mateo	10	--------
Contra Costa	--------	50	Santa Clara	10	50
Fresno	15	--------	Santa Cruz	--------	50
Kern	10	--------	Shasta	--------	20
Lake	--------	50	Solano	15	20
Los Angeles	10	--------	Sonoma	--------	50
Mariposa	--------	20	Stanislaus	--------	20
Merced	15	20	Sutter	15	20
Monterey	10	50	Tehama	--------	50
Napa	15	--------	Tulare	25	--------
Sacramento	--------	10	Yolo	10	--------
San Benito	10	20	Yuba	10	--------
San Bernardino	10	--------			

Many instances of unequal and under-valuation in individual cases were brought to the knowledge of the Board. The inequality, in some instances, was the result of the judgment of the Assessor, and in other instances was caused by the Board of Supervisors reducing fair and full assessments.

Section 9, Article XIII, of the Constitution, provides that the State Board of Equalization is empowered under such rules of notice as the State Board may prescribe as to the action of the State Board, to increase or lower the entire assessment roll, or any assessment contained therein. This provision is supplemented by Section 3692 of the Political Code, which says that the Board may exercise such powers, under such rules of notice to the Clerk of the Board of Supervisors of the county affected, as it may prescribe.

In conformity with the requirements of the Constitution and the Code, the Board passed certain rules prescribing the mode of giving such notice. The Clerk of the Board of Supervisors of each of the above named counties was notified by letter through the United

States mail, and the taxpayers of each of the counties were notified by publication in two newspapers published in the county, that the Board proposed to increase the assessment of the classes of property named in above schedule, and that the Board would hear testimony against the proposed increase until the 20th of September.

The propriety of adding a percentage, not to exceed ten per cent., to the entire assessment of city lots in the City of San Francisco, was discussed, but no conclusion was reached, and a notice that the Board proposed to make the increase was served upon the city, but this notice was issued by a mistake of the Chairman as to the action of the Board.

Many persons in various counties were notified to appear and show cause why their assessments should not be increased; notably the following persons, firms, and corporations in San Francisco were notified to appear on the days named:

September 6th—Anglo-Californian Bank; Bank of British North America; Bank of British Columbia; Bank of California; Belloc Freres; Borel, A., & Co.; California Insurance Co.; Donohoe, Kelly & Co.; Fireman's Fund Insurance Co.; German Savings and Loan Society; Hibernia Bank; Home Mutual Insurance Co.; Lazard Freres; Nevada Bank; Pacific Bank; San Francisco Savings and Loan Society; San Francisco Savings Union; Security Savings Bank; Wells, Fargo & Co.

September 7th—Alaska Commercial Co.; Central Railroad Co.; City Railroad Co.; Market Street Railroad Co.; North Beach and Mission Railroad Co.; Pacific Mill and Mining Co.; Pacific Rolling Mills; Pacific Wood and Lumber Co.; Selby Smelting Mill; Virginia and Gold Hill Water Co.

September 8th—Abrams & Carroll; Ackerman Bros.; Baum, J.; Bachman Bros.; Coleman Bros.; Davidson, J. W., & Co.; Dinklespiel, L.; Feigenbaum & Co.; Huntington, Hopkins & Co.; Holbrook, Merrill & Co.; Heller, M., & Bros.; Keane Bros.; Montanya, Jas. De La, & Co.; Montague, W. W., & Co.; Main & Winchester; Murphy, Grant & Co.; Mosgrove, S., & Co.; Rosenthal, Feeder & Co.; Rosenstock & Co.; Sloane, Wm. & J.; Sachs, L. & M.; Straus, Levi, & Co.; Tay, Geo H., & Co.; Walters, D. N. E., & Co.; Whittier & Fuller; Wakelee, H. P., & Co.

September 9th—Barton, Robert; Bosworth, Wm.; Badlam, Alex.; Cudworth, C. W.; Eldridge, O.; Glazier, J., & Co.; Higgins, Geo.; Haggin, J. B.; Lincoln, Jerome; Meyer, Daniel; Miller, Jr., E. H.; McDonald, R. H.; McDonald, John M.; McDermott, C. F.; McLane, Louis; Page, Calvin; Sharon, Wm.; Spreckles, Claus; Tevis, Lloyd; Wilmerding, J. C.

September 10th—Coleman, Maria; Coleman, Celia; Crocker, Chas.; Fair, Jas. G.; Flood, Jennie L.; Flood, Jas. L.; Flood, J. C., & Co.; Flood, J. C., & Co., trustees; Flood, J. C., and J. V. Coleman, executors of the estate of O'Brien, deceased; Huntington, Hopkins & Co.; Hopkins, Mrs. M. F. S.; May, Isabella C.; McDonough, Agnes; McDonough, Jos.; Stanford, Leland.

September 11th—Boyd & Davis; Company of Associated Stockbrokers; Heuston, H. M.; Nevada Bank; Safe Deposit Co.; Sharon, William.

WRITS OF PROHIBITION.

On Saturday, September 4th, the following persons and corporations appeared, by their attorneys, Messrs. Jarboe & Blanding, and requested that the hearing of their cases, which were set for the 6th, 7th, and 9th of September, should be continued until the 10th September, promising at the time that the parties above named would be ready to be heard on that day, to wit:

The California Insurance Company, Hibernia Bank, Anglo-Californian Bank, Bank of California, Security Savings Bank, German Savings and Loan Society, San Francisco Savings and Loan Society, Alaska Commercial Company, J. B. Haggin, Lloyd Tevis, Claus Spreckles, J. Glazier & Co., and Wells, Fargo & Company.

On Saturday, the 4th, while the attorneys above named were asking for a continuance of the cases of Wells, Fargo & Company, and others named, their clients, Wells, Fargo & Company, Belloc & Company, Bank of British America, and Bank of British North America, by their attorneys, Jarboe & Harrison, Greathouse & Blanding, Wilson & Wilson, and McAllister & Bergin, filed, in the Supreme Court of the State of California, their petitions asking for writs of prohibition against the Board, prohibiting the Board from increasing the assessment of petitioners for the year 1880.

Upon the filing and reading of said petitions, the Court granted the prayer, and issued writs of prohibition, commanding this Board to desist from further proceedings in the matter of increasing the assessment of the petitioners, and to show cause before the Court, on September 10th, 1880, why the Board should not be absolutely restrained and prohibited from any further proceeding in the matter of the assessments of the petitioners.

These writs were served upon the Board on Monday, the 6th September, the day set for the hearing of the cases by the Board.

Between the 4th and the 10th of September, forty other writs of prohibition were served upon the Board, at the instance of that number of the other persons who had been cited to appear before the Board.

The Board immediately took counsel of Honorable A. L. Hart, the Attorney-General, and Honorable A. P. Catlin. Believing that the magnitude of the interests at stake warranted us in so doing, the Board, with the consent of the Attorney-General, retained Mr. Catlin as an associate of the Attorney-General to present the defense of the Board before the Supreme Court.

The leading case, Wells, Fargo & Company vs. State Board of Equalization, came on for hearing on Friday, September 10th, and was ably argued on the part of the Board by the Attorney-General and Mr. Catlin; whereupon the Court took the case under advisement until the 16th of September, on which day judgment was rendered against the Board, and on the 18th, the Court issued a writ in said case, commanding the Board "to absolutely refrain and desist from any further proceeding in the matter of the assessment of Wells, Fargo & Company." In due course, judgment was rendered in all the other cases, and writs were issued and served upon the Board. We desisted.

The question may occur to the Legislature, whether it were better to submit the question to the Supreme Court again, or submit such an amendment to the Constitution to the people as will effectually put the question of the power of the Board beyond a doubt.

In order, therefore, that your Excellency and the Legislature may thoroughly understand the question involved, the effect of the decision upon the action of the Board, and be prepared to agree upon such amendment to the Constitution as shall clothe the Board with the power denied to it by the Supreme Court, we present in full the opinion of the Court, the dissenting opinion of Justice Sharpstein, and the opinion of Justice Thornton, who, while dissenting from the reasoning of the Court, reached the same conclusion. Justice McKee did not file an opinion, but contented himself with merely dissenting.

WELLS, FARGO & CO.
vs.
THE STATE BOARD OF EQUALIZATION.

There is but a single question in this cause, and that relates to the construction of section nine of article thirteen of the Constitution, which reads as follows:

"A State Board of Equalization, consisting of one member from each congressional district in this State, shall be elected, by the qualified electors of their respective districts, at the general election to be held in the year eighteen hundred and seventy-nine, whose term of office, after those first elected, shall be four years; whose duty it shall be to equalize the valuation of the taxable property of the several counties in the State, for the purposes of taxation. The Controller of State shall be ex officio a member of the Board. The Boards of Supervisors of the several counties of the State shall constitute Boards of Equalization for their respective counties, whose duty it shall be to equalize the valuation of the taxable property in the county, for the purpose of taxation; *provided*, such State and County Boards of Equalization are hereby authorized, and empowered, under such rules of notice as the County Boards may prescribe as to the county assessments, and under such rules of notice as the State Board may prescribe as to the action of the State Board, to increase or lower the entire assessment roll, or any assessment contained therein, so as to equalize the assessment of the property contained in said assessment roll, and make the assessment conform to the true value in money of the property contained in said roll."

On the part of the State Board of Equalization it is contended, that by virtue of this section they have the power to increase or lower any and every individual assessment in each and every county assessment roll within the limits of the State, and that, too, irrespective of any action on the part of the County Boards of Equalization in respect to the individual assessments upon the rolls of their respective counties.

If the State Board has such power, it is unquestionably a tremendous power. It can summon to the City of Sacramento each and every taxable citizen of the State to show cause why his individual assessment upon the assessment roll of his county should not be increased. It can call there the farmer from San Diego, the miner from Siskiyou, the mechanic from San Francisco.

That such a power might readily lead to great abuses does not admit of doubt. Such considerations, however, afford no reason for denying the power if it does exist. They should only make us cautious in considering the question, which recurs, and is, what is the true and fair construction of the provision already quoted? Its meaning, when ascertained, we are bound to give effect to, whatever the consequences.

In the first place, the section in question provides for a State Board of Equalization, and also for County Boards of Equalization. They are all to be Boards of *Equalization*. To equalize is to make equal, to cause to correspond, or be like in amount or degree *as compared with something*. The meaning of the term is important to be borne in mind. Now, looking at the provision of the Constitution upon the subject, we find that the duties of the State Board are declared to be "to equalize the valuation of the taxable property *of* the several counties in the State for the purposes of taxation," and the duties of the County Boards are declared to be "to equalize the valuation of the taxable property *in* the county for the purpose of taxation." Then follows the proviso, the ambiguity of which must be sufficiently apparent to every one: "*Provided*, such State and County Boards of Equalization are hereby authorized and empowered, under such rules of notice as the County Boards may prescribe, as to the county assessments, and under such rules of notice as the State Board may prescribe as to the action of the State Board, to increase or lower the entire assessment roll, or any assessment contained therein, so as to equalize the assessment of the property contained in said assessment roll, and make the assessment conform to the true value in money of the property contained in said roll."

Reading the proviso as it is claimed on behalf of the State Board it should be read, that Board is authorized and empowered "to increase or lower the entire assessment roll or any assessment contained therein," and exactly the same power is conferred on the County Boards in respect to the rolls of their respective counties.

For many reasons, it is manifest the proviso should not be so read. To do so would not only lead to the most glaring absurdities and serious conflicts between the respective Boards, but would make the proviso inconsistent with the body of the section and contrary to the fundamental idea of equalization.

To illustrate: The County Boards of the respective counties are in the body of the section given the power "to equalize the valuation of the taxable property in the county"—that is to say, to compare the individual assessments upon the assessment roll, one with another, and make them equal. But how can a County Board, upon the theory of *equalization*, increase or lower the *entire* assessment roll?

It is not pretended that the County Boards are given any power outside of the limits of their respective counties, and it is obvious they have none. No County Board can look to the assessment roll of any other county than its own. It, therefore, can have nothing with which to compare the assessment roll of its own county *as a whole;* and yet the very idea of equalization of necessity presupposes something with which to compare the thing to be equalized. The construction contended for on the part of the State Board would compel us to hold not only that the State Board has the same power as the respective County Boards to increase or lower any individual assessment in an assessment roll, but that the County Boards have the like power with the State Board to increase or lower the entire assessment roll of their respective counties, and that, too, without any power of *comparing* the roll with anything. If, as is contended, the State Board and the respective County Boards have each this power, let us see what absurb and serious consequences might follow: Suppose the County Board of a particular county should lower the entire assessment roll of the county ten per cent. and the State Board should *increase* the entire assessment roll of the same county ten per cent., which would constitute the valid assessment? Or, suppose the County Board of a particular county should increase an individual assessment upon the roll of the county, and the State Board should *lower* the same individual assessment, what then? It will not do to say that the State Board has appellate jurisdiction over the action of the County Boards in the exercise of powers expressly conferred by the Constitution on the County Boards. The Constitution has not given any such appellate jurisdiction, and there is no foundation for the assertion of any such power.

It is evident, therefore, that the reading of the proviso under consideration contended for by the State Board might, and probably would, lead to very serious and absurd results. On the other hand, by reading the proviso distributively—*reddendo singula singulis*—the whole system provided for the equalization of taxes is symmetrical and harmonious, and accords with that manifest intent of local government which permeates almost every part of the Constitution. The County Boards of Equalization are familiar, or should be, with the property in their respective counties—far more so than the State Board, which, in the very nature of things, can have but a general idea of the relative value of the property in the respective counties. It was therefore eminently wise on the part of framers of the Constitution to limit the powers of the State Board, in respect to equalization, as we think they did do by the section under consideration, to the equalization of the assessment rolls of the various counties by comparing the assessment roll of each county with the roll of each and all the others, and thus make the assessment conform to the true value in money of the property contained in the respective rolls; and conferring on the local Boards—the County Boards—the power only to increase or lower the individual assessments upon the roll of their respective counties, and thus making them equal with each other and equivalent to the true value in money of the property assessed. Thus each Board becomes what the provision treats of—a Board of *Equalization*. Each has its own appropriate functions to perform, which can be performed without conflict and in entire harmony with the other. Applying the maxim already quoted, the provision clearly admits of this construction, and we have no doubt that it is its true meaning and intent.

Another consideration strengthens the construction we adopt. If the State Board can interfere with individual assessments upon an assessment roll, it must examine all of the other individual assessments, for in that way alone can the assessments be *equalized*. Now, the time allowed by the statute for the action of the State Board of Equalization is, and the time that can be allowed by any law that can be passed upon the subject, must of necessity be limited to a brief period; for the State Board certainly cannot act before the assessment rolls are made up, and must act before the taxes are paid. It is perfectly plain that any time that could be allowed between these periods would make it impossible for the State Board to act upon the many thousand individual assessments within the State. And we think it clear that the framers of the Constitution never intended that they should do so.

Demurrer overruled.

Let the writ issue as prayed for. ROSS, J.

We concur: MORRISON, C. J.; MCKINSTRY, J.; MYRICK, J.

I agree that the writ ought to issue, for the reason stated in my opinion to be filed.

THORNTON, J.

I dissent: MCKEE, J.

DISSENTING OPINION.

I dissent. The provisions of the Constitution which define the powers and duties of the State Board of Equalization are contained in section nine of article thirteen. By reading all portions of that section, which relate to the State Board, together, I think the intention may be made reasonably clear. It seems to me that they should be read as follows: "It shall be the duty of the State Board of Equalization to equalize the valuation of the taxable property of the several counties of the State for the purposes of taxation, and under such rules as it may prescribe for its action to increase or lower the entire assessment roll, or any assessment contained therein, so as to equalize the assessment of the property contained in said assessment roll, and make the assessment conform to the true value in money of the property assessed."

The major part of this is taken from a *proviso*, but I am unable to perceive that it is repugnant to anything that precedes it. To "equalize the valuation of the taxable property of the *several* counties," is, as I understand it, to equalize it in each separate county, distinct from any other county. If this view be the correct one, there is no inconsistency even between the clause of the *proviso* which confers upon the State Board the power to increase or lower any assessment contained in any roll, and the preceding clause which, according to my interpretation of it, confers upon that Board the power to equalize the valuation of the taxable property of each separate and distinct county. As I view it there is no clause outside of the *proviso* which confers upon the State Board the power "to increase or lower the entire assessment roll" of any county. Without the aid of the *proviso* it would be extremely difficult, I think, to ascertain what powers were intended to be given to the State Board. The rule that a subsequent obscure clause shall not control a previous clear provision is not applicable to this case, in which it is the first provision alone that is obscure. No one doubts that these provisions should be construed according to the most obvious and natural import of the language used.

"Courts cannot correct what they may deem either excesses or omissions in legislation, nor relieve against the occasionally harsh operation of statutory provision without the danger of doing vastly more mischief than good." Per Bronson J. in Waller vs. Harris, 20 Wend. 561.

I think that the application should be denied.

SHARPSTEIN, J.

CONCURRING OPINION.

Strongly impressed with the importance of the questions presented for consideration, I proceed to examine them. And here I desire to state that it is most unfortunate that a Court should be called on under pressure as to time to pass on questions which, above all others, require the fullest consideration. The power of taxation is broad and comprehensive, touching every citizen and resident of the State in their most sensitive interest. Where such a matter is submitted for adjudication, the tribunal to which such function is so trusted should have at least a reasonable time to determine and consider it.

The questions presented for consideration in this case relate principally to the interpretation of the ninth section of Article XIII of the Constitution. That section is in these words:

"A State Board of Equalization, consisting of one member from each Congressional District in this State, shall be elected by the qualified electors of their respective districts, at the general election to be held in the year one thousand eight hundred and seventy-nine, whose term of office, after those first elected, shall be four years, whose duty it shall be to equalize the valuation of the taxable property of the several counties in the State for the purposes of taxation. The Controller of State shall be ex officio a member of the Board. The Board of Supervisors of the several counties of the State shall constitute Boards of Equalization for their respective counties, whose duty it shall be to equalize the valuation of the taxable property in the county for the purpose of taxation; *provided*, such State and County Boards of Equalization are hereby authorized and empowered, under such rules of notice as the County Boards may prescribe, as to the county assessments, and under such rules of notice as the State Board may prescribe, as to the action of the State Board, to increase or lower the entire assessment roll, or any assessment contained therein, so as to equalize the assessment of the property contained in said assessment roll, and make the assessment conform to the true value in money of the property contained in said roll."

Now, under this section what power has the State Board over an individual assessment? That is the main question submitted to us for decision.

There can be no doubt that the County Board and the State Board are alike Boards of Equalization, the power of the former being confined to the county, that of the latter extending to the whole State, and it may be to each county. In my opinion there is as little doubt that the action of the State Board must succeed that of the County Board. The State Board can only act on the assessment roll, or, perhaps, on some substitute for it, and what appears therein. The assessment roll has a well defined meaning in this State. It appears as a roll in the first Act on the subject, passed March 30, 1850. (See Sections 20, 21, Acts of 1850, p. 137.) It is a roll or book, made up primarily by the Assessors of each county, in the mode prescribed by law. The constituents of such a roll are set forth in the Act of 1850. Provisions of a similar character, in fact most of them identical, appear in every Act on the subject since passed. The action of the County Board of Equalization (which has been all along the Board of Supervisors) has succeeded that of the County Assessor, as the action of the State Board must succeed that of the County Board. That the State Board acts subsequent to the action of the County Board, is proved by the fact that it acts only after the assessment roll has been made and passed on by the County Board of Equalization, and equalizes the property over the whole State. The State Board makes no assessment roll, and if it can change an assessment, it cannot do so until the assessment roll comes under their consideration, except in the cases of railroads operated in more than one county, mentioned in Section 10 of Article XIII. And in these cases, the Legislature has enacted that there shall be made by the State Board, an apportionment to each county, and a statement drawn up as to the part apportioned to each county, and transmitted to the County Assessor, who is required to enter the statement on the assessment roll of his county, and this is in accordance with section ten. The State Board makes no assessment roll in this case, but makes a statement only, to be entered on the assessment roll of the proper county. It may be added, that this duty of the State Board is required by the statute to be done in each year, on or before the first Monday in May.

The other duties of the State Board, so far as referred to in section nine, are exercised only on the assessment roll, or it may be some substitute for it. On these the State Board exercises its power of equalization, whatever that may be. How far does this power extend? The section nine referred to states that it shall be their duty "to equalize the valuation of the taxable property of the several counties in the State for the purposes of taxation;" and it is further authorized and empowered, under such rules of notice as it may prescribe as to its action, "*to increase or lower the entire assessment roll,* or any assessment of the property contained in said assessment roll, and make the assessment conform to the true value in money of the property contained in said roll."

There can be no doubt that the State Board, in performing this duty of equalizing the assessment of the taxable property of the several counties in the State, may add to or deduct from the valuation of the property in the entire assessment roll, in any county in the State. This power is given by the language "to increase or lower the entire assessment roll." They can also take each assessment roll and add to it or deduct from it so as to make the assessment or valuation conform to the true value in money of the property contained in each roll. Some rolls may exceed the value of the property assessed in money, and others may be less than such value. Each one must be made to conform to the true value, either by lowering or raising as the state of the roll may require. It may be remarked here, that in making this valuation, it must conform to the *cash* value. That in my opinion is the meaning of the word "value." The value is to be ascertained as provided by law. (Sec. 1, Art. XIII.) That is to say, the mode of ascertaining the value may be provided by law, but no power is here conferred to ascertain anything else than the *cash* value, and the Legislature is not authorized to go beyond this, and fix any standard of valuation by providing a rule of valuation which departs from *cash value.* (Burroughs on Taxation, p. 227–29, and cases cited.)

What authority has this Board as to individual assessments contained in the roll? If it has any such power, it is outside of its power to equalize the property of the several counties as between the counties. It pertains more to the power of assessment—to the function of the assessing officers, who in the first place fix the value. I cannot see why this power is not conferred on the State Board. The language is broad enough to give it. The same form of words is used in relation to this matter with regard to the County Boards and the State Board. If it is conferred in one case, it is in the other. It certainly may be conferred by the Legislature, for the Legislature is authorized to fix the mode and means for ascertaining the values of any property to be assessed, by sections one and thirteen of article thirteen. They may employ the agency of individual Assessors for each county, or one Board of Assessors or more in each county, or may confer this power on the State Board. All this is within the authority of the legislative power, as given by the sections referred to. (See Houghton vs. Austin, 47 Cal. 662; People vs. Solomon, 46 Ill. 332.) As was said by Marshall, C. J., in McCulloch vs. State of Maryland, 4 Wheat. 411: "The Government which has a right to do an act, and has imposed on it the duty of performing that act, must, according to the dictates of reason, be allowed to select the means." The means to be employed is left entirely to the legislative judgment, subject to no restrictions, but that the assessment must be made, except in the case of railroads, operated in more than one county, in the county, city, city and county, town, township, or district in which the property assessed is situated. (Sec. 10, Art. XIII.) Nor is such grant of power to a State Board without a parallel in States where no constitutional inhibition exists—as in Missouri, where such a power was conferred by statute on a State Board in relation to railroads. (See State vs. Lawrence, 55 Mo. 378; Burroughs on Taxation, p. 236.) There is not only no constitutional provision in the way here, but the language of the Constitution confers it. (47 Cal., 662.)

Certain rules of construction were referred to in the argument and their application invoked. The rules referred to are those relating to the office of a proviso, and the canon of a distributive construction, curtly expressed in the Latin words, *reddendo singula singulis.* These rules are very excellent aids on the construction of statutes. when properly applicable, but they are but aids to direct the inquiry, to ascertain the intention of the parties. (See remarks of Field, J., in Ferris vs. Coover, 10 Cal. 628.) This is the correct view as to all rules. They are servants to guide in getting at the end and aim of all construction, the intention of those who have used the language to be construed, not masters to control. Some writer has compared all such rules to the stars to which the mariner looks for guidance on the ocean. But one must be certain they are stars to guide, not false lights which mislead. (See Sedgwick on Stat. and Const. Law, p. 192.)

In the case cited on the argument by one of the learned counsel who spoke for the plaintiff—Wayman vs. Southard, 10 Wheat. 1—the rule as to a proviso is thus stated by Marshall, C. J.: "The proviso is generally intended to restrain the enacting clause, and to except something which would otherwise have been within it, or in some measure to modify the enacting clause." In Voorhees vs. Bank of the United States, 10 Peters, 471, Baldwin, J., speaking of a proviso, says "that in deeds and laws it is a limitation or a grant made, or authority conferred; the effect of which is to declare that the one shall not operate, or the other be exercised, unless in the case provided." Applying those rules we see no difficulty in reaching the conclusion that the latter clause of section nine is a modification to some extent of the duties prescribed in the foregoing part of the section, and that it is a direction that in the very cases spoken of in the proviso the Boards are empowered to act on the whole assessment roll, or any part of it, in order to accomplish the purposes declared, which are manifestly two: 1st, to equalize; 2d, to fix and determine the true value of the property assessed. We see no ground to apply the rule *reddendo singula singulis.* The Constitution distributes the powers and duties, and we cannot redistribute them. These things are done by the sovereign power, and in language clearly meaning what we have above indicated.

When we consider the circumstances under which these provisions were inserted in the Constitution, and the antecedent history in regard to a State Board of Equalization in this State, we should expect to find such powers conferred in the organic law. It is well known that there has been a conviction throughout the State for years that property was not properly valued for purposes of taxation. As was said by Crockett, J., in Savings and Loan Society vs. Austin, 46 Cal. 473: "It had become apparent in this, as in many States, that when the value of property for the purpose of taxation was to be ascertained and finally determined by the local assessors, subject only to a limited control by the County Boards of Supervisors, the grossest inequality frequently existed in the valuations in different counties, whereby the requirement of the Constitution that "taxation shall be equal and uniform throughout the State, was practically abrogated." (See also remarks of Breeze, C. J., quoted by Crockett, J.)

The state of things indicated in these remarks existed when the delegates to the Convention that framed the Constitution were elected, and when the Convention was in session, and it is not extraordinary that steps were taken to put an end to it by constitutional provisions. This was attempted by the provisions of the Constitution, in Section 9, Article XIII. The power to fix a valuation was given to the local Assessor, to the Board of Supervisors, and the State Board, to act in the order in which they are named. I can see nothing in these provisions but the natural outcome of the conviction above mentioned.

The restrictions on this power as to individual assessments, if there are any, must be looked for in the Constitution itself. The power to raise an individual assessment by the State Board is to raise the value of the property assessed, and partakes of the nature of an assessment. "An assessment is a valuation of the property to be taxed." "An assessment, strictly speaking, is an official estimate of the sums which are to constitute the basis of an apportionment of a tax between the individual subjects of taxation within the district. As the word is more commonly employed, an assessment consists in the two processes of listing the persons, property, etc., to be taxed, and of estimating the sums which are to be the guide in an apportionment of the tax between them. When this listing and estimate are completed in such form as the law may have prescribed, nothing remains to be done in order to determine the individual liability, but the mere arithmetical process of dividing the sum to be raised among the several subjects of taxation, in proportion to the amounts which they are respectively assessed. Sometimes the word assessment is used as implying the completed tax list—that is to say, the list of persons or property to be taxed, with the estimates with which they are chargeable, and the tax duly apportioned and extended upon it; but the employment of the word is unusual, except in the cases in which the levy is apportioned by benefits; and in those cases the act of determining the amount of the benefits is of itself, under most statutes, a determination of the individual liability, and its entry upon the roll is an extension of the tax." (Cooley on Taxation, 253. See remarks of Wallace, C. J., in S. & L. Society vs. Austin, 45 Cal., 508.)

If estimation of value is not the whole assessment it is the most essential part of it, and it must be made in the county, city, etc., in which the property is situated. This is the express mandate of the Constitution, except as to the franchise, etc., of railroads operated in more than one county; such assessment may be made by the State Board in any county, or at Sacramento. (Sec. 10, Art. XIII.) The exception is in the same section with the general command; the excepted assessment is to be made by the State Board, and this collocation of the mandate with the exception and the excepted assessment to be made by the State Board strongly tends to show that whenever the State Board exercises this power of assessment it must be in the county, etc., in all other cases than the one excepted. It should be remembered that any Assessor or Board of Supervisors in making this valuation acts under the restrictions of law. Their power is not always unrestricted. A tax founded on an assessment which from corrupt or malicious motives is made excessive may be enjoined. (See Cooley on Taxation, 157, 547, and cases cited.)

In my opinion, when an assessment is to be raised by the State Board, it must be done in the county where the property is situated. The person with whose assessment the State Board is dealing is entitled to notice of time and place where such action is to be had. This was so held in Patton vs. Green, 13 Cal. 329. Judge Cooley says it is a matter of constitutional right. (See Cooley on Taxation, pages 266–7–8, and cases cited in notes.) The section nine under consideration recognizes the right to notice. As this notice is to be had of an act to be done in the county where the property is situated, and the Board must there act, the notice must be given to the party of its contemplated action at a meeting to be held in the county. This is practicable. If it is not under the present legislation, an Act may be passed which will make it easy of accomplishment. If it cannot be done, a person cannot be deprived of a right secured to him by the Constitution. I cannot reach the conclusion that it was intended that the State Board might demand the attendance of a person whose residence is in San Diego, at the State Capitol, on such business, when he owned no property assessed in Sacramento County, with such a provision in the Constitution as that contained in the article referred to. No such oppressive procedure was ever contemplated.

I am further of opinion that the State Board has no power to add any property to the roll, but their power is limited to the property on the roll, so far, at least, as the power to act on an individual assessment is concerned. Section eight, article thirteen, directs the Legislature so to act as to have all the property to be taxed put on the roll.

As it appears from the petition that the property, the assessment of which the Board proposes to deal with, is situated in the City and County of San Francisco, which is admitted by the demurrer, and not denied in the answer, I am of the opinion that the writ ought to issue.

THORNTON, J.

It will be observed that only four of the Judges agree upon the principle "that the Board has no power to increase or lower an individual assessment," while two of the Judges expressly agree, and one by his dissent to the opinion of the Court impliedly agrees, that the Board has that power.

Judge Thornton very justly laments that the Court should be called upon, under pressure as to time, to pass upon a question—the power of taxation—which above all others requires the fullest consideration, and says, "that where such a matter is submitted for adjudication, the Court should have a reasonable time in which to consider and determine it."

From the above premises we derived a reasonable hope, that if the question should be again presented and given a full consideration, the Court might come to a different conclusion. Attorney-General Hart concurred with us in our hope, and stated that one point was yet untouched either by the Court or counsel, to wit: whether the powers of the Board were limited by the Constitution, and whether it was not competent for the Legislature to prescribe other and additional duties for the Board than those named in the Constitution.

Accordingly, the Attorney-General filed a petition for a rehearing in the case of Wells, Fargo & Co. vs. The State Board of Equalization, in which he urged the point upon the attention of the Court. The Court, however, denied the rehearing.

We quote so much of the petition as relates to the point above referred to:

PETITION FOR REHEARING.

To the honorable Supreme Court of the State of California:

The question in this case is whether the State Board of Equalization, in the exercise of its powers conferred by the State Constitution, is limited by Section 9, of Article 13, to the single power of raising or lowering the entire assessment roll of a county. At the former hearing of this cause the argument was so limited by the Court that it was impossible to present the points involved in the manner that the importance of the subject demanded, and the Court decided that the State Board of Equalization possessed the exclusive power to raise or lower the entire assessment roll, while in the several County Boards of Equalization was vested the exclusive jurisdiction and power to deal with the individual assessments contained in the roll.

After quoting Sec. 9, Art. XIII, of the Constitution, he proceeds to say:

In 1871–2 the Legislature of this State created a State Board of Equalization, and granted to it the power "to equalize the valuation of the property of the several counties in the State for the purposes of taxation," but this Court, in a well considered opinion, held that law to be unconstitutional, because it gave to that Board the powers which, by the old Constitution, were vested exclusively in Assessors elected by the qualified electors of the district, etc., to be assessed. When, subsequently, the Convention that drafted the new Constitution met, it embodied in Section 9, of Article 13, the exact language of the Act of 1871–2, as above set out, but added to that language other and more specific language, fully defining what was meant by "equalizing the valuation of the property of the several counties."

In 1880 the Legislature amended Section 3692 of the Political Code so as to authorize the State Board "*to equalize the valuation of the taxable property of the several counties in this State for the purpose of taxation; and, to that end,* * * * *to increase or lower the entire assessment roll, or any asssessment contained therein, so as to equalize the assessment of the property contained in said roll, and make the assessment conform to the true value in money of the property assessed.*"

Sections 3693 and 3695 of the same Code, as amended in 1880, also recognize the same powers in the State Board, and provide part of the machinery for their due enforcement. (Amendments to Political Code, State ed., pp. 26, 27.)

The question which this Court is called upon to determine in this cause is, therefore, whether Sections 3692, 3693, and 3695 of the Political Code, as amended in 1880, are in conflict with any provisions of the State Constitution; and in the determination of this question, resort should first be had to the rule that the judicial power of the State will not interfere to prevent the execution of laws regularly passed by an independent department of the Government, in which is lodged exclusive legislative power by the Constitution, unless the laws complained of are *palpably* and irreconcilably in conflict with some provision of the Constitution. (S. & V. R. R. Co. v. City of Stockton, 41 Cal. 147.)

The Supreme Court of this State, in the case of Smith vs. Judge, etc., 17 Cal. 551, said: "But it is equally well settled that this power (to declare an Act of the Legislature unconstitutional) is not to be exercised in doubtful cases, but that a just deference for the legislative department enjoins upon the Courts the duty to respect its will, unless the Act declaring it be clearly inconsistent with the fundamental law, which all members of the several departments of government are sworn to obey."

"An Act of the Legislature should not be declared unconstitutional and void by the Courts unless there is a clear repugnance between the Act and the Constitution; and where there is a reasonable doubt whether the Act is repugnant to the Constitution, the Court should pronounce in favor of its constitutionality." (Bourland v. Hildreth, 26 Cal. 121; Patterson v. Board of Sups., etc., 13 Cal. 175; Cohen v. Wright, 22 Cal. 293.)

"Constitutions, like statutes and private instruments, must be so construed, if possible, as to give some force and effect to each of their provisions." (French v. Teschemacher, 24 Cal. 518; Hager v. Board of Supervisors, 47 Cal. 223.)

Unless, in view of these well settled principles, the several provisions of the Code which prescribe the duties and define the powers of the State Board of Equalization can be said to be clearly and palpably repugnant to some specific provision or provisions of the Constitution, the Courts would not be justified in defeating the declared object of the Legislature by declaring said provisions unconstitutional; and, in that case, the writ herein should be dismissed, because the provisions of the Political Code clearly and unquestionably clothe the Board with the power to increase or lower individual assessments.

If these provisions of the Code are obnoxious to any provision of the Constitution, we are, by a well settled rule, first driven to inquire where that provision is, so that we may point it out. (Hager v. Board of Supervisors, etc., 47 Cal. 223.)

"Courts cannot declare a law void, upon the ground that it is contrary to the 'spirit and policy of the Constitution,' unless it is at variance with some express or clearly implied provision of that instrument." (Cohen v. Wright, 22 Cal. 293.)

Whether in the distribution of the powers of government the Constitution has undertaken to decentralize, must be a matter of no considerable importance in the determination of this question; the question, and the only question in this case, is, whether words may be found in Section 9 of Article 13 of the Constitution which expressly, or by necessary implication, inhibit the Legislature from conferring on the State Board of Equalization the powers herein undertaken to be exercised, and we respectfully submit that no such words can be found in any part of that instrument.

The first sentence of the section of the Constitution, under which the power is asserted on the one side and denied on the other, creates the Board, and provides that it shall be its duty to equalize the valuation of the taxable property of the several counties in the State for the purposes of taxation. It will be observed that the above simply undertakes to prescribe the duties of the Board, but it does not undertake to limit the powers of the Board.

The case seems to have turned upon two points; one, the meaning of the preposition "of," and the other the "glaring absurdities and serious conflicts which would ensue between the State and County Boards," and the "absurd and serious consequences" which would follow if the State Board held and exercised the power claimed by it.

In the petition for a rehearing by the Attorney-General, he very clearly, we think, pointed out that if the sentence, "property of the county," did not mean "property *in* the county," there could be but one other meaning, that is to say, "the word 'of' would imply ownership, so that the State Board would be limited to the duty of equalizing the valuation of property *belonging* to the several counties of the State."

We do not share with the Supreme Court the apprehension it has of serious conflicts between the County and State Boards, or that any absurd or serious consequences would follow from the exercise of the power by the Board to increase or lower any individual assessment.

The Court, in stating "the absurd and serious consequences" which would follow the exercise of the same powers by both Boards, say: "Suppose the County Board of a particular county should lower the entire assessment roll of the county ten per cent., and the State Board should *increase* the entire assessment roll of the same county ten per cent., which would constitute the valid assessment?" The Court then undertake to show, that by the distribution of the powers as follows—to the County Board the power to increase or lower individual assessments, and to the State Board the power to raise or lower the entire assessment roll—no absurd consequences will follow, but on the contrary, the system will be symmetrical and harmonious, and the theory of equalization be put in practice.

A conflict in kind is likely to take place even under the distribution of the powers assigned by the Court. Suppose the State Board should increase the entire assessment roll of a particular county ten per cent., and afterwards the County Board should, one by one, lower each individual assessment such percentage as would, in effect, reduce the entire assessment roll to the sum it was before the State Board acted, we ask which would be the valid assessment?

To answer either question we are driven, as was the Supreme Court, to presume that the action of the State Board would be preceded by that of the County Board. But the Constitution is silent upon the question when and in what order the powers are to be exercised. The Court say: "It will not do to say that the State Board has appellate jurisdiction over the action of the County Boards. * * * The Constitution has not given any such jurisdiction." Neither has the Constitution said that the State Board must act after the County Board. If the Supreme Court mean to say that property cannot be equalized unless the powers are distributed, we think we have shown that the inequality will exist even when the powers are so distributed.

The question we put is as pertinent as the one asked by the Supreme Court, because so far as the Constitution goes, there is nothing to prevent a County Board, at any time, from undoing indirectly all that the State Board might do. But as the Constitution did not prescribe the time when the several Boards should exercise their powers, it must be assumed that the power to so prescribe was committed to the Legislature, which body wisely ordain that the County Board should first pass on the roll, and that after the equalization in the counties had been completed, the State Board should correct that wherein the County Boards had failed, whether it be to correct the inequality of a single assessment, or of the entire roll. If the Legislature has not the right to so act, then the section in question can only be executed by judicial legislation.

The Court say: "The construction contended for on the part of the State Board would compel us to hold that the County Boards have the like power with the State Board to increase or lower the entire assessment roll of their respective counties, and that, too, without any power of comparing the roll with anything," and ask, "How can a County Board, upon the theory of equalization increase or lower the entire assesssment roll?"

If the Court had been acquainted with the literature of the revenue system of the State it would have seen that it has been the custom of the Assessors of the State to fix upon a certain percentage of "full cash value," at which rate, in their respective counties, they assessed the property in the county. No Assessor has ever pretended that he assessed property at its "full cash value."

Attention was first publicly called to this fact in the report for 1870 of the first Board of Equalization. In that report will be found a table showing, from the statements of Assessors, the percentage of full cash value at which property was then assessed. The fact that such has been the rule among Assessors has been distinctly recognized by each successive Board.

The Supervisors understand this, and know each year at what percentage the property in their counties is assessed. Now the law provides a rule of *comparison* for each Board of Supervisors, to wit: "All taxable property must be assessed at its full cash value." When a Board of Supervisors, therefore, finds that the Assessor has based his assessment upon a certain percentage of "full cash value," its duty is to increase the entire roll, so as "to make the assessment conform to the true value in money of the property contained in said roll."

Again, the Court say "that it was wise to limit the powers of the State Board, in respect to equalizing, to the equalization of the assessment rolls of the various counties," because "the County Boards of Equalization are familiar, or should be, with the property in their respective counties—far more than the State Board."

Experience has shown that the obstruction to a just and uniform assessment of property throughout the State, lies more with the Boards of Supervisors than with Assessors.

The Assessor's conscience is quickened by a special oath that he has assessed the property listed in the assessment roll at "full cash value." His individual sense of responsibility is larger than a Supervisor's is, and, in a degree, it compels him to approach at least to a "full cash value" assessment.

On the other hand, there always has been, and always will be, under the present revenue system—and possibly under any system there would be—an effort on the part of every Board of Supervisors to compel a low assessment of property. The county needs each year a specific sum, and if the assessment is low a high rate of taxation for county purposes will raise the amount for the county, but the State will be directly defrauded of her due. We do not mean to say that all Assessors approach a full cash value assessment, but we do mean to say, that the incentive on the part of the Assessor is greater than on the part of the Supervisors to comply with the law in this respect. Several instances occurred this year in which the Supervisors of certain counties undertook to reduce largely the assessment by the Assessors. In Merced, the Assessor assessed the landed estate of a noted firm at the same value as other and contiguous land of like quality and condition had been assessed. The total assessment of the firm was $396,064. Just before the close of the labors of the Board of Supervisors, it reduced the assessment to about $200,000. The District Attorney and Assessor filed their protests before this Board, and the members of the firm were cited to appear before the Board. Testimony was taken on both sides, and the Board increased the assessment to the amount fixed by the Assessor.

In the County of San Mateo, the Supervisors reduced a number of assessments, aggregating $346,220, to $227,005. We heard the cases, and increased the assessments as fixed by the Board to $305,285.

In Solano County, like sweeping reductions were made by the Board of Supervisors; but this Board did not act, owing to the decision of the Supreme Court. The decision, of course, rendered null our action in the other two counties.

If the Board is able to estimate the per cent. of full cash value at which each of the fifty-two counties is assessed, and to correct the irregularities of such assessments, it ought to be able, by its investigations, to know where very marked individual instances of unequal assessments occur, and to correct the same.

The question whether the Board had the power to increase or lower a single assessment was under discussion in the Board before it undertook to exercise the power, and the subject was given full and patient consideration.

Advised by the books that the Courts, in construing a Constitution or a law, looked to "the occasion and necessity of the law, the mischief felt, and the object and remedy in view," and applying this rule of construction to Section 9 of Article XIII of the Constitution, it seemed to the Board very clear, that the section gave to the Board the power to increase or lower, not only the entire assessment roll of a county, but any assessment contained therein.

Now, what was the mischief felt, what was the necessity of the section of the Constitution in question, what was the remedy in view?

Turning to the legislation upon the question, we find that in 1869 an Act was passed which provided for a State Board of Equalization. This Board was legislated out of office by the Political Code, which created another Board which continued in existence until superseded by the present Board.

These various Boards undertook to correct the abuses of unequal assessments, until finally, by the decision of the Supreme Court in Houghton vs. Austin, which denied to the Board the powers conferred by law to raise or lower the entire assessment roll, the Board was deprived of all power except to determine the rate of State tax. But the Boards had, in the meantime, investigated the question and pointed out the mischief.

In the report for 1870 of the first Board of Equalization, the Board says:

> In isolated and poorer sections of the State, the small holders of land are assessed to nearly the full value of their land, while the large landed proprietors are assessed for scarcely more, per acre, than the sum which should represent the actual taxes per acre to be paid by them. The complaints are loud and grievous against this onerous discrimination. * * *
>
> Again, there has grown up a practice in some of the counties of evading the payment of their proportion of State taxation, and this fraud is accomplished by fixing the county rate of taxation at a high figure, so that a low valuation of property shall yield sufficient revenue for county purposes, while the State tax being already fixed, the State receives but a small portion of the taxes justly due; *but if the Assessor shall perform his duty, then there follows an indiscriminate reduction of values by County Boards of Equalization.*

The Board states also, the case of San Mateo, in which county, in 1870, the Board of Supervisors went through the assessment book as a mower goes through a field of grain. It reduced assessments from $100,000 to $20,000, and the total reduction was from $4,301,196 to $1,897,200. The Board pointed out that there was no remedy under the law organizing the Board. In its report for 1874-5, the Board of Equalization says:

> In 1875 the assessment of solvent debts secured by mortgage was very irregularly and imperfectly effected. The Assessors generally listed the property, *but the County Boards of Equalization, in many of the counties, canceled the assessments.*

From 1870 to the adoption of the Constitution the complaints were many about the low assessment of land held in large tracts. The press voiced the complaint, and the State Board of Equalization exerted its moral force to prevent the injustice, but without avail.

The mischief was clearly pointed out by the authorities charged with the duty of equalizing; it was known by the people, and at the time of the calling of the Convention to frame a new Constitution there was no question upon which public sentiment was stronger than that there should be a State Board of Equalization, charged with plenary powers of equalizing, and that such Board should be a constitutional body.

Indeed, it is safe to say that the strongest of the motives that induced the people to call the Convention to frame a new Constitution, and impelled its adoption, was the popular belief that a new Constitution would, and that the present Constitution in verity did, provide a means to correct unequal assessments in the State. The popular reading of that instrument was, that the State Board had the power to increase individual assessments, and that thereby large tracts of land would be properly assessed.

From what has been said, the necessity of granting to the Board power alike over the entire roll and any assessment therein, will be apparent. From the organization of Boards of Supervisors to the present time the Boards have had the power, where the Assessor failed to assess at full cash value, to increase such assessments to such value. That Boards of Supervisors have not done so, but on the contrary have reduced the assessments of large landholders, is the very point of grievance.

It is fair to presume that the members of the Constitutional Convention, elected at a time of great public excitement on this question, understood exactly, in a general sense, what the people wanted; understood that as Assessors had heretofore made unequal assessments, and that as the Boards of Supervisors had failed to abate the evil, the necessity was plainly apparent for a central authority over both Assessors and Supervisors.

When we consider the widespread mischief of unequal assessments; the publicity given to the same, by the complaints of the people, by the press, and through the reports of the Boards of Equalization; when we remember that the County Boards of Equalization have always had the power to equalize, and compel by such power an equality of assessment in their respective counties, but had failed notoriously to perform their duty; when we recall the fact that at the time of the calling the Convention to frame the new Constitution, the question of "land monopoly" extensively engaged the public mind, and that it was conceded that the only lawful measure to be adopted to abate that evil was the assessment of large tracts of land at full cash value, so as to compel their division into small tracts; and that, as cognate to the question, the new Constitution provided that "cultivated and uncultivated land of the same quality and similarly situated shall be assessed at the same value," the Board could but come to the conclusion that the framers of the new Constitution, in the light of past failures of all measures to effect an equality of assessment, intended to, and did, by Section 9, confer on the State Board power to increase or lower any single assessment in the assessment roll of the several counties.

In the event that the coming Legislature shall propose to the people an amendment to the Constitution, conferring upon the State Board of Equalization the power to increase or lower any assessment contained in an assessment roll, it will be well to keep in mind the office of a *proviso* as applied by the Supreme Court. The Court, after quoting the first clause of the section, in respect to the powers of the Board, say: "Then follows the *proviso*, the ambiguity of which must be sufficiently apparent to every one."

The Legislature ought not to be misled by this remark, but ought, in framing an amendment to the section, if a proviso is used, to avoid obscurity, because, before an amendment can be adopted, and any case arise thereunder, the constituent of the Court may change, and the rule obtain as stated by Mr. Justice Sharpstein, that "a subsequent obscure clause shall not control a previous clear provision."

Mr. Justice Thornton very clearly points out the office of a proviso and states: "That the *proviso* is a *modification*, to some extent, of the duties prescribed in the foregoing part of the section, and that it is a direction that, in the very cases spoken of in the proviso, the Boards are empowered to act on the whole assessment roll or any part of it."

Our own opinion was, that while the proviso was intended to effect what Justice Thornton says was its intention, it also was intended to "qualify or restrain the generality" of the preceding section, by providing that the powers conferred should not be exercised, except after notice shall have been given under such rules as the State Board may prescribe. In other words, that the section should be read as if it said: "The State Board is authorized to increase or lower the entire assessment roll or any assessment contained therein; *provided*, notice of its intentions so to do shall first be given under such rule as the Board may prescribe.

The above remarks are made, not by way of offensive criticism of the decision of the Court, but to vindicate the Board from the imputation of hasty or ill advised assumption of power not conferred by the Constitution. As we have shown before, in our action we were fortified and sustained by the fact that the Constitutional Convention had the knowledge derived from the people, the press, and the reports of former Boards of Equalization of the existence of unequal assessments in the counties, and the inequality between the counties; that the remedy had been pointed out, that naturally the Convention had adopted the remedy; by the fact of the existence of a strong popular sentiment before the meeting of the Convention, that the power to equalize single assessments would be given to the Board, and of the still stronger sentiment that the power had been bestowed on the Board by the Constitution, and further that our construction of the section was sanctioned by the Legislature which provided in Section 3692, Political Code, that "the duty of the Board is to increase or lower the entire assessment roll or any assessment contained therein."

Had we been permitted to exert the power claimed, not less than $10,000,000 would have been added to the assessment roll.

And here we may say in closing these remarks, that if the Board is confined to the power alone to increase or lower the entire assessment roll, the purpose in creating the State Board will not fully be accomplished; that is to say, we cannot hope to establish or preserve a perfect equality of assessment between the counties.

We will illustrate: Classes of property, as between the counties, are unequally assessed. For instance, sheep in one county are assessed at $2 per head; in another county at $1 00 per head. In such case the assessment of sheep in the latter county ought to be increased 100 per cent to make the assessment of sheep equal the assessment of the sheep in the former county. Under the decision of the Court it is doubtful whether the Board has the power to increase by percentage a class of property in the assessment roll.

Now, upon comparison, we find that in the county where the sheep are assessed at $1 per head, the entire assessment roll ought to be increased 20 per cent to make it equal, in respect to full cash value, the entire assessment roll of the other county.

Now, suppose, with our limited power, the Board should add on such 20 per cent upon the entire roll, the sheep in that county would be assessed by such equalizing, at $1 20 per head, while the sheep in the other county would still remain at $2 per head. The inequality of assessment between the sheep would not be disturbed, except in degree.

It needs only this illustration to convince the most sceptical that while the Board may be able to adjust marked inequalities in the general assessment between counties, yet inequality will still exist between individual assessments and between classes of property.

To attain an approach to equality and uniformity of assessment, the Board should be clothed with the following powers:

First—To increase or lower any assessment on the assessment book.

Second—To increase or lower the entire assessment of any class of property: as of real estate, improvements, or personal property, except money.

Third—To increase or lower the assessment of any species of any class of property: as of real estate, city, or town lots; of improvements, improvements on farms, or lots; and of personal property, sheep, horses, or hogs.

Fourth—To increase or lower the entire assessment roll of any county.

Fifth—Possibly to add property to the assessment roll where it appears such property has escaped the Assessor.

CAN THE BOARD EQUALIZE WHEN SITTING AT SACRAMENTO?

The various opinions of the Judges of the Supreme Court will doubtless be read by the members of the Legislature with great respect, with a view towards framing an amendment to the Constitution, which shall not be obnoxious to the criticism of the Court.

We wish, therefore, the attention of the Legislature directed to the last part of the dissenting opinion of Mr. Justice Thornton. That distinguished Judge argues that the Board has the power to increase or lower any single assessment, but claims that the power must be exercised within the county where the property to be affected is situated, because the increase or diminution of an assessment by the Board, though called equalizing by the Constitution, is, in fact, an assessment, which assessment must be done in the county, etc., where the property is situated, in accordance with the Constitution, which declares that: "All property * * * shall be assessed in the county, city, etc., in which it is situated."

Judge Thornton says, that "when an assessment is to be raised by the Board, it must be done in the county where the property is situated, and that the person with whose assessment the Board is dealing is entitled to notice of time and place where such action is to be had, and that the notice must be given to the party of the contemplated action at a meeting to be held in the county." He further remarks: "This is practicable." To the practical mind no argument is needed to show that this is utterly impracticable. The revenue of the State, for the year, must be collected within each year. The assessment and listing of property, its equalization, and the collection of the tax, must follow in order, and be performed at distinct periods of time; one act cannot be performed until the other is completed. Experience has shown within what space of time these acts can severally be performed. With the most economic distribution of time for the performance of duties relating to revenue by all the officers connected therewith, there would remain not more than six weeks within which the Board of Equalization could exercise its function of equalizing.

There are fifty-two counties in the State, the State is 700 miles long, and a glance will show the impossibility of the Board traversing the State and hearing testimony within the space of time allotted to it.

This objection, however, to a want of time, will not apply if the Board can exercise its functions at the seat of government.

In the majority opinion, the Court, as an argument in support of its view of the case, say: "Another consideration strengthens the construction we adopt. If the State Board can interfere with individual assessments, it must examine all of the other individual assessments. The State Board cannot act before the assessment rolls are made up, and must act before the taxes are paid. It is perfectly plain that any time that could be allowed between these periods would make it impossible for the State Board to act upon the many thousand individual assessments within the State."

This seems a consideration more proper to be addressed to the Legislature as to the policy of the law than to be used in support of a construction of the Constitution. But for fear it may have some force with the Legislature in the determination whether the Board could exercise the powers claimed if granted in the Constitution, we wish to make some observations.

The Assessor begins to assess by the first of March; indeed, in many of the large counties, before that time much of the real estate is already valued, though not listed on the book. The members of the Board can travel separately through the State from March to the first of August, in which time each member can satisfy himself as to whether the Assessor is assessing up to the correct standard, and in what instances he has failed to properly assess individuals. The principal under-valuation occurs in the assessment of large tracts of land. The District Attorney and interested citizens will, as they did this year, inform the Board of such instances.

When the members assemble in August to equalize, they have already half completed their work. The Board had no difficulty this year in hearing all the applications for reductions, and proposals to increase assessments. There was, in all probability, a larger number of such applications and proposals this year than there will be in any one year in future, once that Assessors and citizens know and believe that the State Board will do its duty.

Complaint is made of the hardship of compelling a citizen to travel from San Diego to Sacramento, before the Board, to be heard in respect to his assessment.

The question of taxation seems always to be treated as if there was no reciprocity between the State and the citizen. If the State is bound to protect, the citizen is also bound to render to the State all that is her due. Nothing can be clearer in theory, however much it may fail in practice, that it is the duty of the citizen to see that he is assessed for all that the law calls for. If he, therefore, stands by and sees that the Assessor has assessed him below full cash value, and for less property than he owns, he consents to a wrong, and ought not to be heard to complain if he suffers some penalty therefor.

But to return to our subject. If an amendment to the Constitution is submitted, granting the Board power to affect individual assessments, and if there is any fear that the opinion of Judge Thornton that equalizing is assessing, and that such assessing must be done at a sitting of the Board in the county where the property is situated, will become the opinion of the Court, then the section of the Constitution declaring that all property shall be assessed in the county, etc., where it is situated, should be amended so as to exempt therefrom the action of the State Board.

The Supreme Court, in Houghton vs. Austin, decided that the increasing or lowering of the entire assessment roll by the Board is an *assessment*, which could not be made by the former Board of Equalization, because the members were not elected in the district, county, etc., where the property is situated.

If the Supreme Court shall adhere to the opinion that *equalizing* is *assessing*, and shall adopt the conclusion flowing necessarily from Judge Thornton's opinion that an assessment of property must be made in the county where it is situated, that the Board must be in each county when it raises or lowers the entire assessment roll of a county, the State Board will have been completely phlebotomized to death by the lance of construction of the Supreme Court, and as it beholds its life taken away, the Board can only exclaim with the old woman in the nursery rhyme—

> "If I am so soon done for,
> What was I begun for?"

WHY INCREASE OF ENTIRE ASSESSMENT WAS NOT MADE.

As before stated, it was the opinion of the Board that in certain counties, heretofore named, real estate, other than city and town lots, and sheep, were assessed below their full cash value. The authorities of each of said counties were notified of the intention of the Board to increase the assessment of said properties, and nearly all of the counties affected, by their officers and citizens appeared, and presented testimony against such action. In view of the fact that the Supreme Court had prevented the Board from laying the basis for an increase of the assessments, and more particularly because the Court had cast a doubt upon our power to select a *class* of property for an increase of assessment, the Board deemed it prudent, this year, to permit the assessments to stand. We are still firm in our opinion that the counties named in the schedule need the percentage indicated, to be added to the assessments of real estate other than city and town lots, and sheep, to make the assessment thereon equal to the ratio of value at which said classes of property were assessed in the other counties.

Special attention next year will be given to those counties, and we hope that their Assessors will be induced more faithfully to comply with the law.

PERSONAL PROPERTY.

Assessors have assured us that they have been anxious to discover all the personal property in their respective counties, but under the present revenue system it is almost impossible for the Assessor to obtain all such property.

Assessors generally, do not have, and especially this year they did not have, the time to examine the books and stock of merchants, to ascertain the amount and value of the merchandise on hand. In former years the Assessor had an opportunity to see the property, because he traveled through the country, and assessed such property as he found on hand. Under the present system, he relies—as in fact he had to do in a measure in former years—on the statement of the taxpayer who is required to make a statement, under oath, of the amount of property on hand on the first Monday in March. This statement comes in any time between said day in March and the last days of June, and the Assessor cannot verify the statement. As the Assessor does not see the property, he relies on the statement, as being made under oath, for the truth as to the amount of the property, but must rely on the mere statement of the taxpayer as to its past value. The owner of personal property, therefore, is his own assessor. We can imagine how near the majority of the taxpayers will come to telling the truth about the value of their property. Here is a manifest injustice. The owner of land must be assessed by the Assessor, but the owner of personal property is his own assessor. If an oath is of any value in extracting the truth, the owner of personal property should be compelled to state, under oath, not only the amount of personal property he had, but its value.

How far apart merchants and Assessors may be in estimating the value of merchandise may be illustrated by a case in point in Sacramento County. A leading mercantile house having almost a monopoly in their line, and reputed to carry at all times, at least, stock to the value of half a million dollars, was assessed by the Assessor for their stock of merchandise $250,000, which was thought to be a reasonable assessment. One of the firm went before the Board of Supervisors and testified under oath that the stock in March in value did not exceed $150,000, and the Board reduced the assessment to the latter sum.

Probably he was not cross-examined by the Board to ascertain what he meant by "value." He may have had some such mental reservation as a merchant admitted to a member of the Board that he had when he stated the value of his property to the Supervisors. He thought the assessable value of his shelf goods was only half the value he put upon them when he took account of stock, because he did not know when he would sell them. It is by such subterfuges that men evade their duty to the State. We do not believe that all the personal property has been assessed. As was before stated, the increase of the assessment of the State this year over the last year is $118,579,905. Schedule P shows the amount of increase in each class of property.

The Constitution provided for the assessment of solvent credits, franchises, and shares of capital stock; the last two being properties which before had never been assessed. We learn from the Assessors' reports that the value of these is as follows: Solvent credits, $19,984,777; franchises, $16,347,146; and shares of stock, $8,449,329, being a total of $44,781,252. In estimating whether there has been an actual increase of the personal property in the State or an increase in its assessment, this amount must be deducted from the amount of the increase of the assessment of personal property.

The total increase was $51,474,780; deducting $44,781,252, we have $6,693,528 as the actual increase in the assessed value of personal property, exclusive of solvent credits, franchises, and shares of capital stock.

As this year the value of rolling stock of railroads assessed by the Board is not in the personal property column, for the purpose of comparison, the value of the same rolling stock was deducted from the value of the personal property for 1879, and thus we arrive at the fact that the increase in the assessment is $51,474,780.

As up to this year the rolling stock of railroads was assessed by Assessors at a uniform value, which was distributed to the counties pro rata, and by supposing that such assessment was made this year by the Assessors, an exhibition of the assessed value of all personal property for the past few years will enable one to compare the assessment of this year with that of former years, and also to determine the actual assessment of 1880, in respect to the same kinds of personal property which were assessed in former years.

The assessed value of personal property, other than money, and exclusive of mortgages, solvent debts, etc., was:

In 1872	$71,384,299
In 1873	107,552,018
In 1874	95,862,451
In 1875	86,377,602
In 1876	122,762,866
In 1877	114,642,786
In 1878	106,175,102
In 1879	101,198,292
In 1880	107,891,820

The estimate for 1880 is arrived at by deducting the assessment of franchises, solvent credits, and shares of capital stock from the total value of personal property—and as the value of rolling stock this year is not included in personal property column, the same amount at which rolling stock was assessed last year, to wit, $3,017,065, was added to the remainder, making $107,891,820. Thus it will be seen that the assessed value of the personal property this year is only $1,716,718 over the assessment of 1878, and $6,749,966 less than that of 1877. We cannot state precisely the true value of the personal property in the State, but we feel sure that many million dollars worth escape assessment. There are other means than the reports of Assessors by which to determine whether personal and other property are undervalued by the Assessors.

For instance, the Insurance Commissioner reports to the Governor that on the 31st of December, 1879, the amount of fire insurance policies in force was the sum of $225,664,839 84.

As franchises, solvent debts, and shares of stock are not insurable, the amount of the assessment of these properties must be deducted from the amount of personal property to find the amount of personal property insurable; by so doing we find it to be $104,874,755. Add this amount to the total value of improvements, $111,536,922, and we have the sum of $216,411,677. We find, therefore, so far as the figures show, that the whole of the improvements and personal property of the State is actually insured for $9,253,162 more than the assessed value of the same.

Knowing how cautious capital is, and especially so when wielded by corporations engaged in underwriting, can we escape the conclusion that not only does a large amount of personal property escape assessment, but that both the improvements on real estate and personal property are vastly undervalued. We believe that if it were possible to secure, for once, a full and correct assessment of the State, the assessment roll would aggregate $1,000,000,000.

AS TO THE REAL ESTATE.

For a further proof that the property of the State has been undervalued, we direct attention to Schedule K.

The law requires that when a mortgage relates to land situated in more than one county, the Board must apportion the valuation of the mortgage to be assessed in each county. The Assessors reported to the Board, on a blank prepared by the Board, the assessed valuation of the property covered by each of such mortgages, and the value of the mortgage. These mortgages covered land in thirty-two counties, ranging from Lassen, in the north, to San Diego, in the south.

The first column of the schedule shows the names of the two counties having land covered by one mortgage; the second and third columns show the total assessed value of the property covered by the mortgage, and the value of the mortgage. These are totalized in the fourth and fifth columns. Finally, the grand total shows that the amount of all the mortgages apportioned by the Board is $2,864,871; the value of the property mortgaged is $4,427,000, and that the value of the mortgages, exclusive of interest due, amounts to 64 71-100 per cent. of the assessed value of the property subject to the mortgages.

These statements cover property in thirty-two counties, and show the assessment of property by that number of Assessors, and, therefore, we ought fairly to deduce therefrom the percentage of full cash value at which real estate and improvements were assessed throughout the State.

The question was asked a gentleman connected with a savings bank, and also a commercial bank: What is the margin of the value of real estate upon which the banks loan money secured by mortgage? He replied: The amount of money which a bank would loan upon real estate would be about sixty per cent. of its value. We asked: What do you mean by the "value?" His response was: The amount the property will bring at forced sale at foreclosure under an order of sale. We asked: Upon the estimate men put on property when applying for loans, how much do banks usually loan? He replied: About fifty per cent.

That is to say, upon a piece of rural or city property worth, as the market goes, waiting the usual time when the buyer and seller meet, about $1,000, a bank would loan $500. We believe this to be the rule, and, applying it, let us endeavor to deduce from the table an estimate of how real property was assessed this year.

As we stated before, the Table K shows that the mortgages amount to 64.71 per cent. of the assessed value of the property mortgaged. In fact, the percentage is greater, because, upon comparing Schedule K with Schedule L, it will be seen that in those counties where the per cent. of the value of real estate to which all the mortgages amount is highest, that is to say, where the people are more heavily mortgaged, there in those counties the percentage of the value of the property actually under mortgage to which the loans amount is also the highest; for instance, the percentage of mortgages of all the real estate in Alameda is 29.238, and in San Francisco, 22.351, while the property mortgaged is subject to mortgage to the amount of 84.73 per cent. On the other hand, the percentage in the first case in Merced is only 17.183, and in Stanislaus, 18.276, and the property mortgaged is subject to mortgage only to the extent of 33.38 of its value. In other words, in the more heavily mortgaged Counties of Alameda and San Francisco, where over one fourth of all the property is mortgaged, the borrower has been able to obtain $84 93 on each $100 assessed value of property, while in the Counties of Stanislaus and Merced, where not more than $\frac{2}{11}$ of the real estate is mortgaged, only $33 38 has been loaned on each $100 of assessed value.

But, for the sake of the argument, we will accept 64.71 per cent. as the true showing of Schedule K, and applying the rule governing banks and capitalists in loaning money, that is to say that not more than 50 per cent. of what the law terms full cash value of property is loaned on it, the assessed value of the property in Schedule K, instead of being $4,427,091, ought to be $5,729,742; and, in the same ratio, the assessed value of the real estate and improvements, instead of being $460,694,217, ought to be $596,251,354, an increase of $135,557,137. The conclusion is, that real estate and improvements together have not been assessed at more than a fraction over 77.265 per cent. of "full cash value." Our estimate, drawn from personal observation and investigation, is that the assessment is about 80 per cent. of full cash value.

We are fortified in our estimate by the fact that, of the $96,811,171 secured by mortgage, the savings banks, according to the Bank Commissioners' report, held on the 1st of January, 1880, the sum of $43,640,398, and that on that date the commercial banks had loaned out $32,178,176, a portion of which, we presume, was secured by mortgage. We may assume that two thirds of the amount secured by mortgage was borrowed from sources where friendship and sympathy do not influence the margin upon which money is loaned.

Though not strictly connected with the subject in hand, it may be interesting to note that the amount of mortgages on real estate and improvements, to wit: $96,811,171, amounts to nearly one fifth of the assessed value of such property, and that, as the amount of solvent credits is $19,984,777, it follows that the people of the State are in debt not less than $116,795,948.

MONEY.

The amount of money assessed in 1879 was $9,866,986, and the amount assessed in 1880 is $24,678,330; being an increase over the assessment of the previous year of $14,811,344.

We have no means of ascertaining the precise amount of money in the State, or what proportion of it was reached by the Assessors.

From the Bank Commissioners' reports, respectively, to Governor Irwin and to your Excellency, we learn the amount of money on hand in the various banks on the 1st of January, in the years 1879 and 1880, as follows:

1879—In Commercial Banks	$7,433,180 49
1879—In Savings Banks	2,375,414 47
1879—In Foreign Banks—San Francisco	2,699,129 85
Total	$12,507,724 81
1880—In Commercial Banks	$9,353,741 99
1880—In Savings Banks	3,122,539 37
1880—In Foreign Banks—San Francisco	3,178,630 76
Total	$15,654,912 12

From an examination of an intermediate report, and one made up to 30th June, 1880, we ought to be able to assume that the amount of money on hand in the banks, subject to the jurisdiction of the Commissioners, on the first Monday of March, 1880, was not less than $16,000,000, and that that amount was assessed to the banks. But we are unable to do so, for the reason that an incident occurred during the examination in respect to the increase of the assessment of a bank in San Francisco, which led the Board to believe that a large amount of money either was shipped out of the State previous to the assessing day in March, or was not given in to the Assessor. An officer of the bank in question was being examined, under oath, touching the assets of the bank, with a view to increasing the assessment. He testified that the bank, in the month of February, 1880, bought in New York City, by telegraph, $1,000,000 of United States bonds, and paid for them by buying exchange on New York, and that the bank parted with the custody of the money. Of course the bonds were not assessed, and shortly afterwards the bank sold the bonds, which had never left New York. What legal necromancy was afterwards used to escape the assessment of the money the Board is not advised, but the bank named evaded the assessment of $1,000,000 in money. How many other banks practiced the same evasion we do not know.

For the information of those who desire to pursue the subject further, we would state, from reports of Bank Commissioners, that on the first day of January, 1879, the savings banks had out, in loans on real estate and other securities, $55,500,289, and were due depositors $57,846,025. The commercial banks had loaned on real estate and personal security $40,514,494, and were due depositors $25,091,954.

On the first of January, 1880, the savings banks had loaned out $46,106,128, and were due depositors $51,864,903. The commercial banks had loaned out $32,178,176, and were due depositors $29,579,435.

The whole volume of money on hand in the banks, and the amount deposited by depositors and due them, on the first Monday in March, 1880, was $97,099,250, but we are unable to deduce from the above the precise amount of money in the State. We are informed by gentlemen in San Francisco, who have given the subject attention, that the total amount of money in the State does not exceed $30,000,000.

The fact that so much of all the money in the State was assessed, and that it was assessed at full cash value, is one of the strongest reasons why all other property should be assessed at full value.

LARGE AND SMALL TRACTS OF LAND.

As is stated in the remarks at the end of Schedule S, that the Board undertook to have the Assessors report the average value of tracts of land held in certain classes, we hoped to ascertain therefrom whether a compliance with the provisions of the Constitution and the law, that "every tract of land containing more than 640 acres of land should be assessed by sections," had the effect of increasing the assessed value of such lands.

The following table shows the average assessed value of land in the classes named, per acre, in some of the counties of the State, and which may be taken as a fair example of how the same classes were assessed in the other counties.

Average Assessed Value of Land, per acre, in the following Classes of Land in the Counties Named.

COUNTY.	Ten Acres and Under	From 10 to 40 Acres	From 40 to 60 Acres	From 60 to 100 Acres	From 100 to 160 Acres	From 160 to 240 Acres	From 240 to 320 Acres	From 320 to 400 Acres	From 400 to 640 Acres
Colusa	$28 59	$8 27	$14 04	$12 17	$11 26	$13 43	$22 59	$12 92	$14 72
Contra Costa	99 72	26 00	24 00	25 00	12 00	10 50	11 00	12 00	8 00
Kern	10 70	3 34	4 09	3 66	2 47	3 85	3 03	2 64	1 40
Los Angeles	22 97	16 63	16 10	12 82	6 86	9 68	6 96	6 42	3 74
Marin	153 58	50 37	26 54	34 12	18 37	17 91	16 59	16 51	12 81
Monterey	56 60	26 71	28 84	14 03	10 63	7 31	6 92	6 85	4 25
Sacramento	80 00	70 00	35 00	30 00	20 00	15 00	16 00	15 00	10 00
San Bernardino	500 00	35 00	18 00	8 00	5 00	3 50	3 00	5 00	3 00
San Joaquin	68 59	17 89	39 89	30 83	23 24	25 90	18 58	19 33	11 82
Santa Barbara	32 27	10 42	14 18	5 34	5 24	3 92	2 76	3 36	2 14
Santa Cruz	82 00	61 00	45 00	31 00	10 00	7 00	4 00	5 00	3 00
Solano	65 00	50 00	45 00	30 00	25 00	20 00	15 00	10 00	3 00
Sutter	20 40	10 40	13 00	11 60	12 25	10 54	9 68	7 61	5 05

We think that Assessors have still followed the "old way." There seems an air of enchantment about estates of many acres, that steals away the senses of Assessors and incapacitates them from performing their duty. All statistics, or rather the deductions from them, are more or less fallacious; but when we observe the regular procession of decreasing values, per acre, from the tracts of 10 acres to the tracts of 640 acres, we can but come to the conclusion that Assessors have not performed their duty. It will not do to say that the smaller tracts are cultivated, and therefore more valuable; because the Constitution and the law both require that "cultivated and uncultivated land, of the same quality and similarly situated, shall be assessed at the same value." The popular sense is probably against this rule, and Assessors were influenced by it.

It was supposed by the framers of the Constitution, that an enforcement of the provision of the Constitution above quoted, would have the effect to secure equality of assessment, and thus have a tendency to cause the sale of large tracts of land and consequent division into small farms. We shall endeavor next year to have this provision of the Constitution impartially enforced.

After the above remarks, it may seem illogical, though in truth it is not so, to say that the value of land does increase, in popular estimation, in proportion as the holdings are smaller in respect to the number of acres. The land of the small farm may be no better than the land of the large farm, but it derives its added value from social causes; the better roads, the church and school house, the social atmosphere, and the culture possible only to people in closely settled territories. The advocates of small farms will find in this table a strong argument in support of their theory.

FULL CASH VALUE.

Since the organization of the State, the rule of assessment has been "full cash value." Each Assessor defines this term to suit his purposes. So apparent was the evil of having as many definitions as there were Assessors, that the Legislature of 1872 undertook, in the Political Code, to precisely define the term, which it did by enacting that "the term 'full cash value' means the amount at which the property would be taken in payment of a just debt due from a solvent debtor."

The effect of this definition, and of the creation of the State Board of Equalization, may be seen by comparing the assessment of 1871 with that of 1872. The assessment of 1871 was $268,709,138; of 1872, $636,378,114; an increase of $367,668,976. In both those years mortgages and solvent debts were assessed. In 1872, the assessment, exclusive of mortgages and solvent debts, was $542,170,889, and in 1873, mortgages and solvent debts not being assessed, the assessment was $527,203,982; a decrease from the previous year of $14,966,907. At the January term, 1874, in the case of Houghton vs. Austin (47 Cal. Rep., page 651), the Supreme Court decided that so much of the Code as gave to the Board the power to increase or lower the entire assessment roll was unconstitutional, and thereafter the Board lost even a moral control over the Assessors. In consequence thereof, in 1874 the assessment fell to $511,717,069.

The following table shows the assessed values in the years named:

1872	$542,170,889 00
1873	527,203,982 00
1874	511,717,069 00
1875	521,308,330 00
1876	594,230,621 00
1877	586,980,107 00
1878	584,583,651 00
1879	547,622,769 00
1880	666,202,674 00

Comparing the assessment of 1874 with that of 1879, in which years neither mortgages nor solvent debts (credits so called now) were assessed, we perceive that the assessed valuation in five years had only increased $35,905,700, being an increase in five years of a fraction less than 7.017 per cent., or an increase per annum of a shade over 1.403 per cent. According to the census reports, the population of this State in 1870 was 560,247, and in 1880 it is 864,836, an increase in ten years of 304,589, being an increase of 54.367 per cent.

If we assume that the increase in population has regularly progressed, the population in 1874, was 682,082; and in 1879, 834,377, an increase of 155,295; being an increase in five years of 22.328 per cent., or an annual increase of 4.466 per cent. In other words, while the population from 1874 to 1879 inclusive, increased 22.328 per cent., the increase in the assessed value of all property was only 7.017 per cent.

If we deduct from the assessment of 1880 the amount of franchises, solvent credits, and shares of capital stock which were not assessed in former years, we find, for comparison's sake, that the assessed value of all other property is $621,421,422. Deduct therefrom the assessment of 1875, and we find the increase since that year to be $100,113,092, being an increase for five years of 19.204 per cent., or an annual increase of 3.840 per cent.

Assuming, as we said, that the increase of population was regular, the population in 1875 was 712,541; and the increase from that time to 1880 is 152,295; being an increase of 21.373 per cent., or an annual increase of 4.274 per cent. That is to say, while the population has increased since 1875, 21.373 per cent., the assessed value of property has increased 19.204 per cent., and this includes the increase in assessment of railroads by the State Board of Equalization.

But the most striking comparison is between the year 1872 and 1880. In 1871 the assessment of the State was $268,709,138, and in 1872, it was, exclusive of mortgages, solvent credits, etc., $542,170,889. In the latter year it is believed that under the stimulus of the Board of Equalization, the assessment of the State was very nearly at full cash value, although not wholly so.

The increase in assessment of the same kind of property in 1880 over 1872 is $79,250,523, or 14.617 per cent., while the increase in the population from 1872 to 1880 is 243,672, or 39.228 per cent.

There are some uncertain factors in the above comparisons, which would slightly affect the deductions to be drawn therefrom, but it is very manifest that, according to the tables, the growth of the State in wealth is not commensurate with the growth of the State in population. We do know, however, that the last decade has been one of great prosperity; 6,000,000 more of acres of land have been brought into cultivation; the Southern Pacific Railroad has been built to the State line, advancing in value the property of all the counties which it traverses; manufactures have multiplied, and on every hand we see the marks of advanced prosperity. The end of labor is not merely to eat and drink, there must be something created by it, or stagnation ensues. Estimating that of the total population only one in five is a male, capable of labor and of creating property, and that the sum of his labor for each year has been the creation of property to the value of only $50, there would be added to the State, from the first of the year 1872 to the last of 1879, property to the value of $55,221,640. But property, especially real estate, increases in value by the mere influx of population. City property increases in value because the population of the surrounding country increases, and the country values increase because the city is growing.

A study of these statistics confirms the conclusion we reached from observations made during our visit to the counties, that all the property of the State had not been listed, and that the property assessed had not been assessed at "full cash value."

We believe that the increase in the assessment in 1880, in a great measure, is due to the visit of the Board to the several counties named heretofore, to the effort made to impress upon the minds of Assessors the true meaning of the term "full cash value," and to the readiness of nearly all of the Assessors to comply with the instructions of the Board. If we can once get Assessors to thoroughly comprehend the meaning of the term, and faithfully apply the rule, one question affecting equality of assessment will have been solved, and the judgment of the people in creating the Board will have been vindicated.

DEFINITION OF THE TERM "FULL CASH VALUE."

The definition of the term "full cash value" used in the Code, was taken from the statutes of the State of New York, passed as early as 1823. In the public documents of the State, the definition itself has been defined and illustrated so often that there can be no mistake about the construction placed upon the term by the authorities of that State, though for nearly sixty years they have had the same difficulty we have had in this State in having the rule rigidly applied.

We have illustrated the definition to Assessors something in this wise: In each county, town lots and farming lands are constantly changing hands. The seller and buyer mutually agree upon the value of the property sold and bought, and the multiplicity of sales shows that there is no difficulty in coming to an understanding of the market value. If A has a piece of property and is *solvent*, and is indebted to B, and B is desirous of purchasing the property, and if he had the money to pay for the property would purchase it, is it doing violence to the language of the definition, to say that the amount for which A, *being solvent,* parts with his property, on payment of his debt, is exactly the amount for which in cash he would sell the property? It is manifest that if A values his property at one thousand dollars, and in the current course of business in real estate transactions he could sell the same for one thousand dollars, and he owes B one thousand dollars, and B is in the attitude of a buyer, A can pay his debt to B by the transfer of the property to him.

There is so much confusion of ideas among Assessors as to the meaning of the term, that we may be pardoned for referring to the construction put by the authorities of the State of Ohio upon an equivalent term. The Constitution of Ohio provides that "laws shall be passed, taxing by a uniform rule * * * all real and personal property according to its "*true value in money.*" The revised statutes of that State provide that "each separate parcel of real property shall be valued at *its true value in money;* but the price for which such real property would sell at auction, or at forced sale, shall not be taken as the criterion of the true value," and that "personal property shall be valued at the *usual selling price* thereof at the time of listing, and at the place where the same may then be."

In a circular of instruction, issued by Honorable John F. Oglevee, Auditor of the State of Ohio, for 1880, to the real estate Assessors of the State, in discussing the question: "By what rule is the value of real property to be determined," he quotes and adopts the instruction given by General James H. Goodman, in 1870, then Auditor of the State, which is as follows:

> What a *particular individual* will pay does not furnish a rule; the prices at *forced sales* ought not to be accepted as a guide, as such sales are generally made in unfavorable circumstances for any but one or two unconscionable buyers. The only value that can approach uniformity, as applicable to a multitude of cases, and approximate equality and justice, *is the usual selling price of similar property in the same vicinity.* This would be the rule then, if the Legislature had not prescribed any rule on the subject, but, as will be seen, the Legislature has adopted this identical rule.

We have endeavored to induce the Assessors to apply the rule as we have illustrated it. The supervision by the Board, in this one respect alone, will go far towards establishing an equal assessment throughout the State.

There should be no difficulty in applying the rule by any ordinarily intelligent Assessor, yet we have been met by the objection, urged by a number of Assessors, that it is difficult to tell the value of property until it is sold.

We learn from Magee's Real Estate Circular, that in San Francisco, in October, there were one hundred and seventy sales of real estate, consideration, $1,163,143, and in November, one hundred and seventy-two sales, amounting to $945,699.

If, in November, one hundred and seventy-two purchasers can agree with the same number of sellers upon the separate value of that many city lots, surely the Assessor ought to assess such property at the value fixed by the purchasers and sellers; and there ought to be no difficulty in ascertaining such value, seeing that he has access to the records, wherein are displayed all the transactions in real estate in the city. And so in the counties, if the Assessors would, in the Winter months, make an abstract of the sales of property, from the county records of their respective counties, they would, if they adopted the values fixed by those interested, have a complete answer before County Boards of Equalization to any objection that property has been assessed at more than its true value.

This leads us to the suggestion that if the true money consideration for the transfer of real estate was named in the conveyance, Assessors would have a standard of value fixed beyond a peradventure. In what manner grantors could be compelled to name the true consideration, we leave to the wisdom of the Legislature.

RECOMMENDATIONS.

STATEMENT TO ASSESSORS.

Section 3629, Political Code, requires the Assessor to exact from each person a statement under oath, setting forth specifically all the real and personal property owned by such person, or in his possession, etc., at twelve o'clock, M., on the first Monday in March.

Section 3632 enacts that every person who refuses to furnish the statement shall, for each refusal, forfeit to the people of the State the sum of $100, to be recovered by action. Section 3633 provides that if any person neglects or refuses to give under oath the statement, the Assessor must note the refusal on the assessment book opposite his name, and must make an estimate of the value of the property of such person; *and the value so fixed by the Assessor must not be reduced by the Board of Supervisors.*

In San Francisco it seems that many of the very wealthy persons and banks, the bulk of whose property was personal, refused to give any statement to the Assessor, for the reason that, even under the penalty provided in Section 3633, it was more advantageous to them to have an arbitrary assessment by the Assessor than to disclose their property, as the Assessor would more likely undervalue than overvalue their property. A few of those who refused to give their statements went before the Board of Supervisors and had their assessments reduced $31,950, although the Assessor had marked the words "A. A." opposite each name, to indicate refusal to give statement. The Auditor hesitated whether to disregard the action of the Board of Supervisors, on the ground that the letters "A. A." on the assessment book did not comply with the statute; but finally, in which he was probably correct, he permitted the deduction to stand.

We desire to call the attention of the Legislature to the necessity of providing a more stringent and corrective penalty for the refusal to give a statement. When a person is possessed of personal property, such as bonds, choses in action, costly paintings, and fine furniture, such property is practically withdrawn from the sight of the Assessor, and upon a refusal to give a statement, the Assessor is apt to fix a valuation thereupon far below the true value, even when he intends by an arbitrary assessment to punish for the refusal.

Thus the one who infracts the law, and evades his duty as a good citizen, actually profits by his wrongdoing. The refusal to give a statement ought to be made a crime and heavily punished. The Assessor should still have the power to fix an arbitrary assessment, but he should be compelled to make a statement, under oath, at the close of his assessment, of the names of those persons who refused to give a statement, and file the same with the District Attorney of his county, whose duty it should be to proceed against such person by information or indictment.

REPEAL OF SECTIONS 443 AND 3719, POLITICAL CODE.

Section 443 of Political Code, which requires the Controller to report the amount necessary to be raised for school purposes, to the Board of Equalization, and Section 3719, which requires the Board to levy the tax to raise the amount so reported necessary, should be repealed. They are useless, as the Legislature always makes the appropriation, and directs how much shall be raised for school purposes. The space occupied by these sections is wanted for amendments.

SECURED SOLVENT CREDITS.

The Constitution provides that a mortgage, deed of trust, contract, or other obligation, by which a debt is secured, shall, for the purposes of assessment, be deemed and treated as an interest in the property affected thereby.

Subdivision 6 of Section 3629 requires the assessment of "all solvent credits unsecured by deeds of trust, mortgage, or other lien on real or personal property."

Where personal property is subject to a lien for the payment of a debt, the Assessors have been obstructed in collecting the tax, in all conceivable ways, which we will not here enumerate. One question has presented itself which is difficult of solution. "A" owns real estate and has a quantity of wheat in possession, which is pledged to him for the payment of a loan to B. He has an interest in the wheat, and the Assessor cannot collect the tax on such interest because he owns real estate. The Assessor is obstructed by A in the collection of the tax on B's interest in the wheat because A claims that his interest in the wheat is an undivided one. The Assessor generally assesses to A the whole of the wheat and hazards the collection of the tax. Thus the infraction of the law is made familiar to him. In assessing the security on personal property, at least, we have grasped the shadow and lost the substance.

We think the section of the Constitution should be amended so as to confine the assessment of securities to those which affect land only. While the section stands as it now does the Assessor will violate it.

COUNTY ASSESSORS AND AUDITORS.

Schedule T is a summarized statement of the reports of Assesors which, by Section 3655, they are required to make to the Board. We are satisfied that these reports are not trustworthy. We will not at this time make public the instances where the Assessors have failed to correctly give the statistics of their counties.

We invite each member of the Legislature to examine the statistics of his county as presented in this schedule. He will be astonished at some of the statements. Assessors never have in this respect performed their duty with fidelity.

We would recommend that the statistics of the State should be gathered once in five years; that the Assessors should have a deputy especially charged with the duty; one who is fully informed of the immense value of correct statistics, and who will proceed with something of the enthusiasm that comes from knowledge.

Section 3728 requires the Auditor of each county to send a statement to the Board of the values of the different classes of property. We experienced this year great difficulty in procuring from all of the Auditors correct statements.

The columns in the assessment book for "value of mortgages" and "deductions of mortgages" ought to balance, which they do not, except in few instances. The consequence was that in the reports of the Auditors the sum of the values of the various classes of property did not equal the "total value of all property." In the effort to obtain true statements from some of the Auditors we met with courtesy and a ready compliance; from other Auditors we received only insulting replies. It was only with much patience and great labor that we are able to present correct tables of the values of the State.

We respectfully ask that Section 3728 be amended so as to require the Auditor to make such statements concerning the assessment book as the Board may require.

There is a penalty attaching to a failure on the part of Auditors and Assessors for failure to perform their duty, but no attention has been paid to it in the past. We repeat the recommendation of the Board of Equalization made in the report for 1876 and 1877: "We would, therefore, recommend that the law be so amended that at least 33⅓ per cent. of the fees and salaries of the Assessors and Auditors shall be withheld from them until they produce a receipt from this Board, showing that they have complied with the law in making their statements."

NOTICE OF MEETING OF BOARDS OF SUPERVISORS.

Section 3654 requires the Clerk of the Board of Supervisors to give notice, by publication in a newspaper, of the time when the Board will meet to equalize. This is entirely unnecessary. The Assessor has to the first Monday in July to complete the assessment book, and on that day he must deliver it to the Clerk of the Board. Section 3672 requires the Board of Supervisors to meet on the first Monday in July to equalize the property. As the law fixes the day when the

Board meets, there is no use to advertise such fact. If the Assessor does not deliver the book before the said day in July, the time taken up by advertising is so much time lost to the Board for equalizing. So much of Section 3654 as requires the Clerk to so advertise, should be repealed.

LAW ON REVENUE TO BE REVISED.

The whole of so much of the Political Code as relates to revenue should be revised. As amended at the last session of the Legislature, the provisions as to the performance of duties by the various officers are most illogically and confusedly stated. For example: Section 3627 concerns the rule of valuation of all property, the assessment of capital stock, assessment of land and improvements separately, assessment of uncultivated land, and taxation of mortgage. The mingling of many subjects in one section should be discountenanced. Each section should contain but one subject, or, if the subject has several branches, the sections should be grouped together. The county officers were misled a number of times, because their duties were not stated in the proper place.

CONTINGENT EXPENSES.

We respectfully ask the Legislature to make an appropriation for the contingent expenses of the Board, not less than $500 for the next two fiscal years. We were put to much inconvenience in the past year for want of such appropriation.

SERVICES OF A STENOGRAPHER.

It was found necessary, on the 20th of August, to employ a stenographic reporter to report the testimony of the witnesses before the Board in respect to the increasing or lowering of the entire assessment roll and any assessments therein. The Board employed Mr. W. T. Hume, at the rate of $10 per day. He was employed from August 22d, to September 18th, inclusive, a period of 24 days, and took the testimony of 200 witnesses. He transcribed 480 folios from short into longhand, for which he charges $96; paper furnished, $4 50, making in all, $340 50. We respectfully ask that an appropriation of such sum be made for the payment of Mr. Hume.

QUADRENNIAL ASSESSMENT OF REAL ESTATE.

The Board is of the opinion that real estate should be assessed but once in four years. California is not now subject to rapid fluctuations in the value of land. She is now in the condition of other and older States, in respect to the constancy of values. There is no reason that there should be an annual assessment of real property.

It is a common complaint in each county that there is no equality in the assessment of land of the same condition and quality. This inequality is ascribable to three causes:

First—Assessors are not elected, as a rule, for their special fitness as judges of the value of land.

Second—If they are good judges of land and its value, their time is too limited to permit them to visit in person each and every tract of land in their respective counties.

Third—The assessment is usually done by deputies, while the Assessor remains in his office fully employed in revising their work and preparing the assessment book. Each deputy is a resident of the district which he assesses, and is naturally inclined to favor his district by a low assessment. We are therefore in favor of a change of the law so as to permit an assessment of land but once in four years.

We merely outline the machinery necessary. There should be two persons appointed, during the last year of the Assessor's term of office, by the Board of Supervisors. These persons should be chosen for their special fitness as judges of land and its value. They should, in conjunction with the Assessor, visit each tract of land and town in the county. They should begin their visit by the first of August. When the examination is completed, they should either then list, as on the assessment book, the name of the owner of the land and the value of his land, or should classify the lands as by districts or grades, as the Legislature may determine.

When the listing is completed, they should hold a meeting to hear complaints, and to equalize. The values fixed by them shall be the values at which the land shall be assessed on each of next four years by the next succeeding Assessor. City and town lots being more subject to change in values may be assessed once in two years. No extra pay need be allowed the Assessor, except to the Assessor who first makes the assessment, as, thereafter, the Assessor will have less work than he has now, and will not need so many deputies. In some of the eastern States the system is in vogue and meets general satisfaction.

The Board is of the opinion that this system of fixing values will give more general satisfaction than does the present. There will be a more general interest taken by the people, and there will be more certainty that the values fixed are nearer the true value than now obtains.

We hope the Legislature will give this subject its attention.

NEWSPAPER ACCOUNTS.

When the Board determined to notify certain counties of the proposed intention to raise the assessment on real estate and sheep, the Board, according to law, published a notice in two newspapers published in each of the counties affected. The publishers of such newspapers sent their accounts to the Board for such advertisements. We transmitted the accounts to the Board of Examiners for audit and payment out of the appropriation for "official advertising." There has been some hesitation about auditing the accounts, on account of some doubt whether we had the power to order the publication of the notice. The publishers are urging payment, and we ask the Legislature to appropriate sufficient money to pay said claim.

All of which is respectfully submitted.

WARREN DUTTON, Chairman.
T. D. HEISKELL,
M. M. DREW,
JAMES L. KING,
D. M. KENFIELD (ex officio),
State Board of Equalization.

E. W. Maslin, Secretary.

STATISTICAL STATEMENTS.

SCHEDULE A.

Summarized statement of the reports of the Auditors of the several counties, showing the total value of all property upon which the State tax was levied for 1880.

COUNTIES.	Total Value of all Property.	COUNTIES.	Total Value of all Property.
Alameda	$49,298,448	Sacramento	$25,748,293
Alpine	366,699	San Benito	3,938,935
Amador	2,872,387	San Bernardino	3,680,746
Butte	12,898,094	San Diego	4,995,469
Calaveras	2,608,316	San Francisco	253,520,326
Colusa	17,875,773	San Joaquin	27,463,315
Contra Costa	8,170,523	San Luis Obispo	4,663,085
Del Norte	820,250	San Mateo	7,764,610
El Dorado	2,989,733	Santa Barbara	5,487,053
Fresno	7,533,327	Santa Clara	25,530,723
Humboldt	6,607,386	Santa Cruz	6,596,512
Inyo	1,177,662	Shasta	2,813,577
Kern	5,853,881	Sierra	1,741,537
Lake	2,556,274	Siskiyou	3,724,857
Lassen	1,303,430	Solano	12,124,576
Los Angeles	18,502,652	Sonoma	18,802,353
Marin	8,924,530	Stanislaus	9,730,946
Mariposa	1,465,243	Sutter	5,202,790
Mendocino	6,373,983	Tehama	6,627,363
Merced	6,441,416	Trinity	1,093,939
Modoc	1,843,058	Tulare	6,408,888
Mono	2,365,439	Tuolumne	1,976,572
Monterey	8,076,874	Ventura	3,331,979
Napa	9,182,661	Yolo	12,909,950
Nevada	9,061,990	Yuba	5,035,252
Placer	7,999,343		
Plumas	2,100,302	Total	$666,183,320

NOTE.—The above table shows the value upon which the State Board fixed the rate of State taxes. Subsequently the Board received advices that in several counties certain mistakes had been discovered, which have been rectified. The following tables show the true values as reported by the Auditors.

SCHEDULE B.

Statement showing amounts to be raised, and rate of State taxes for the thirty-second fiscal year.

Amounts to be raised:	
For the General Fund	$1,750,000 00
For the School Fund	1,400,000 00
For Interest and Sinking Fund	315,000 00
Total	$3,465,000 00
Taxable property	$666,183,320 00
Deduct 12 per cent. for delinquencies under Section 3696, Political Code	79,941,998 00
Amount upon which the rate is based	$586,241,322 00
Amount of State tax on each one hundred dollars to raise $3,465,000 00	59 cents.
Tax fixed by law for the Drainage and Construction Fund	5 cents.
Total State tax	64 cents.
The State tax was apportioned as follows:	
For the General Fund	30 cents.
For the School Fund	23 cents.
For the Interest and Sinking Fund	6 cents.
For Drainage and Construction Fund	5 cents.
Total	64 cents.

SCHEDULE C.

Showing from the Statements of the Railroad Corporations the amount of Rolling Stock owned by them for the year ending first Monday in March, 1880.

Railroads.	Locomotives	Sleeping Cars	Passenger Cars	Emigrant and Smoking Cars	Baggage, Express, and Mail Cars	Caboose Cars	Box Freight Cars	Flat Freight Cars	Dump, Hand, Section, and other Cars
Amador Branch	------	------	------	------	------	------	------	------	------
California Northern	2	------	2	------	1	------	6	6	1
California Pacific	12	------	12	4	6	3	56	152	30
Central Pacific	122	12	87	65	32	44	1,629	1,290	360
Northern Railway	------	------	------	------	------	------	------	------	------
Sacramento and Placerville	4	------	6	------	2	------	34	40	13
San Francisco and North Pacific	8	------	9	------	3	------	40	100	58
San Pablo and Tulare	------	------	------	------	------	------	------	------	------
Southern Pacific	46	1	37	31	12	7	562	367	223
Stockton and Copperopolis	3	------	3	------	1	------	16	62	7
Vaca Valley and Clear Lake	2	------	2	------	2	------	5	10	8
Narrow Gauge Railroads.									
Nevada County Narrow Gauge	3	------	2	------	2	------	16	20	3
North Pacific Coast	11	------	13	4	3	------	30	254	12
Santa Cruz	3	------	3	------	------	------	5	27	7
South Pacific Coast	10	------	19	1	4	4	35	150	20
Totals	226	13	195	105	68	58	2,434	2,478	742

SCHEDULE D.

Showing Assessed Value per Mile of Roadway, Roadbed, and Rails, and Rolling Stock and Franchise of Railroads assessed by the State Board of Equalization for 1880.

NAME OF RAILROAD COMPANY.	Number of Miles.	Value of Roadway, Roadbed, and Rails.	Value of Rolling Stock.	Total Value of Roadway, etc., and Rolling Stock.	Value of Franchise.	Total Value per Mile.
Amador Branch	27.000	$9,900 00	----------	$9,900 00	$600 00	$10,500 00
California Northern	26.500	6,600 00	$832 08	7,432 08	2 00	7,434 08
California Pacific	112.500	11,200 00	2,811 56	14,011 56	2,000 00	16,011 56
Central Pacific	604.000	11,800 00	6,464 00	18,264 00	2,000 00	20,264 00
Northern Railway	114.300	11,060 00	----------	11,060 00	2,000 00	13,060 00
Sacramento and Placerville	48.500	9,200 00	1,914 44	11,114 44	1 00	11,115 44
San Francisco and North Pacific	92.000	9,350 00	2,501 19	11,851 09	2,000 00	13,851 09
San Pablo and Tulare	44.000	10,200 00	----------	10,200 00	1,000 00	11,200 00
Southern Pacific	711.560	10,800 00	1,933 15	12,733 15	2,000 00	14,733 15
Stockton and Copperopolis	44.630	10,400 00	1,990 82	12,390 82	1,000 00	13,390 82
Vaca Valley and Clear Lake	29.750	7,000 00	1,094 12	8,094 12	300 00	8,394 12
*Nevada County Narrow Gauge	22.500	6,888 00	2,166 66⅔	9,054 67	1,000 00	10,054 67
*North Pacific Coast	79.750	5,450 00	2,492 79	7,942 79	1 00	7,943 79
*Santa Cruz	21.165	5,800 00	1,686 75	7,486 75	1 00	7,487 75
*South Pacific Coast	45.300	7,600 00	3,543 05	11,143 05	1 00	11,144 05

NOTE.—Those marked * are Narrow Gauge Railroads. Number of miles, Broad Gauge, 1,854.740; number of miles, Narrow Gauge, 168.715; total miles, 2,023.455.

SCHEDULE E.

Showing Assessment of Roadway, Roadbed, and Rails, Rolling Stock and Franchises of Railroads Assessed by State Board of Equalization for 1880.

NAMES OF RAILROADS.	Value of Roadway, Roadbed, and Rails.	Value of Rolling Stock.	Total value of Roadway, etc., and Rolling Stock.	Value of Franchise.	Total Assessment.
Amador Branch	$267,300 00		$267,300 00	$16,200 00	$283,500 00
California Northern	174,900 00	$22,050 00	196,950 00	53 00	197,003 00
California Pacific	1,260,000 00	316,300 00	1,576,300 00	225,000 00	1,801,300 00
Central Pacific	7,127,200 00	3,904,256 00	11,031,456 00	1,208,000 00	12,239,456 00
Northern Railway	1,264,158 00		1,264,158 00	228,600 00	1,492,758 00
Sacramento and Placerville	446,200 00	92,850 00	539,050 00	48 50	539,098 50
San Francisco and North Pacific	860,200 00	230,100 00	1,090,300 00	184,000 00	1,274,300 00
San Pablo and Tulare	448,800 00		448,800 00	44,000 00	492,800 00
Southern Pacific	7,684,848 00	1,375,550 00	9,060,398 00	1,423,120 00	10,483,518 00
Stockton and Copperopolis	464,152 00	88,850 00	553,002 00	44,630 00	597,632 00
Vaca Valley and Clear Lake	208,250 00	32,550 00	240,800 00	8,925 00	249,725 00
Nevada County Narrow Gauge	154,980 00	48,750 00	203,730 00	22,500 00	226,230 00
North Pacific Coast	434,637 50	198,800 00	633,437 50	79 75	633,517 25
Santa Cruz	122,757 00	35,700 00	158,457 00	21 16	158,478 16
South Pacific Coast	344,280 00	160,500 00	504,780 00	45 30	504,825 30
Totals	$21,262,662 50	$6,506,256 00	$27,768,918 50	$3,405,222 71	$31,174,141 21

SCHEDULE F.

Showing Apportionment of Assessment of Property of Railroads among Counties entitled to same for 1880.

Names of Railroads and Counties receiving Apportionment.	Number of Miles of Railroad in each County.	Apportionment of Franchise.	Apportionment of Roadway, Rails, etc., and Rolling Stock.	Total Amount of Apportionment.
Amador Branch R. R.				
Amador	8.000	$4,800 00	$79,200 00	$84,000 00
Sacramento	19.000	11,400 00	188,100 00	199,500 00
California Northern.				
Butte	14.500	29 00	107,765 10	107,794 10
Yuba	12.000	24 00	89,184 90	89,208 90
California Pacific R. R.				
Napa	41.000	82,000 00	574,473 77	656,473 77
Sacramento	.500	1,000 00	7,005 77	8,005 77
Solano	40.000	80,000 00	560,462 22	640,462 22
Yolo	31.000	62,000 00	434,358 22	496,358 22
Central Pacific R. R.				
Alameda	85.300	170,600 00	1,557,919 20	1,728,519 20
Butte	45.000	90,000 00	821,880 00	911,880 00
Fresno	61.060	122,120 00	1,115,199 84	1,237,319 84
Merced	36.750	73,500 00	671,202 00	744,702 00
Nevada	30.250	60,500 00	552,486 00	612,986 00
Placer	112.750	225,500 00	2,059,266 00	2,284,766 00
Sacramento	41.000	82,000 00	748,824 00	830,824 00
San Francisco	4.000	8,000 00	73,056 00	81,056 00
San Joaquin	56.750	113,500 00	1,036,482 00	1,149,982 00
Santa Clara	8.500	17,000 00	155,244 00	172,244 00
Shasta	18.800	37,600 00	343,363 20	380,963 20
Sierra	2.150	4,300 00	39,267 60	43.567 60
Stanislaus	22.630	45,260 00	413,314 32	458,574 32
Sutter	10.000	20,000 00	182,640 00	202,640 00
Tehama	40.540	81,080 00	740,422 56	821,502 56
Tulare	12.650	25,300 00	231,039 60	256,339 60
Yuba	15.870	31,740 00	289,849 68	321,589 68
Northern Railway.				
Alameda	6.850	13,700 00	75,761 00	89,461 00
Colusa	46.000	92,000 00	508,760 00	600,760 00
Contra Costa	23.750	47,500 00	262,675 00	310,175 00
Solano	16.950	33,900 00	187,467 00	221,367 00
Yolo	20.750	41,500 00	229,495 00	270,995 00
Sacramento and Placerville.				
El Dorado	18.750	18 75	208,395 61	208,414 36
Sacramento	29.750	29 75	330,654 38	330,684 13
San Fran. and North Pacific R. R.				
Marin	15.000	30,000 00	177,766 30	207,766 30
Sonoma	77.000	154,000 00	912,533 69	1,066,533 69
San Pablo and Tulare.				
Alameda	1.400	1,400 00	14,280 00	15,680 00
Contra Costa	34.100	34,100 00	347,820 00	381,920 00
San Joaquin	8.500	8,500 00	86,700 00	95,200 00
Southern Pacific R. R.				
Fresno	17.930	35,860 00	228,305 32	264,165 32
Kern	117.830	235,660 00	1,500,346 69	1,736,006 69
Los Angeles	139.480	278,960 00	1,776,019 32	2,054,979 32
Monterey	49.280	98,560 00	627,489 47	726,049 47
San Benito	17.650	35,300 00	224,740 04	260,040 04
San Bernardino	48.880	97,760 00	622,396 21	720,156 21
San Diego	164.570	329,140 00	2,095,493 98	2,424,633 98
San Francisco	7.410	14,820 00	94,352 61	109,172 61
San Mateo	25.100	50,200 00	319,601 98	369,801 98
Santa Clara	59.300	118,600 00	755,075 61	873,675 61
Santa Cruz	2.150	4,300 00	27,376 26	31,676 26
Tulare	61.980	123,960 00	789,200 44	913,160 44
Amount carried forward				$28,813,633 39

SCHEDULE F—Continued.

NAMES OF RAILROADS AND COUNTIES RECEIVING APPORTIONMENT.	Number of Miles of Railroad in each County.	Apportionment of Franchise.	Apportionment of Roadway, Rails, etc., and Rolling Stock.	Total Amount of Apportionment.
Amount brought forward				$28,813,633 39
Stockton and Copperopolis R. R.				
Calaveras	.660	660 00	8,177 93	8,837 93
San Joaquin	32.810	32,810 00	406,542 54	439,352 54
Stanislaus	11.160	11,160 00	138,281 47	149,441 47
Vaca Valley and Clear Lake.				
Solano	17.000	5,100 00	137,600 00	142,700 00
Yolo	12.750	3,825 00	103,200 00	107,025 00
Nevada Narrow Gauge R. R.				
Nevada	18.780	18,780 00	170,046 64	188,826 64
Placer	3.720	3,720 00	33,683 36	37,403 36
North Pacific Coast R. R.				
Marin	61.250	61 25	486,495 88	486,557 13
Sonoma	18.500	18 50	146,941 61	146,960 11
Santa Cruz R. R.				
Monterey	1.165	1 16	8,722 06	8,723 22
Santa Cruz	20.000	20 00	149,734 93	149,754 93
South Pacific Coast R. R.				
Alameda	6.200	6 20	69,086 88	69,093 08
Santa Clara	27.400	27 40	305,319 47	305,346 87
Santa Cruz	11.700	11 70	130,373 64	130,385 34
Total amount apportioned				$31,174,141 01

NOTE.—The difference of twenty cents between this and former table is caused by loss of fractions in apportioning.

SCHEDULE G.

Showing Apportionment of Assessment of Railroads to the several Counties of the State for 1880.

COUNTIES.	Amounts.	COUNTIES.	Amounts.
Alameda	$1,902,753 28	San Bernardino	$720,156 21
Amador	84,000 00	San Diego	2,424,633 98
Butte	1,019,674 10	San Francisco	190,228 61
Calaveras	8,837 93	San Joaquin	1,684,534 54
Colusa	600,760 00	San Mateo	369,801 98
Contra Costa	692,095 00	Santa Clara	1,351,266 48
El Dorado	208,414 36	Santa Cruz	311,816 53
Fresno	1.501,485 16	Shasta	380.963 20
Kern	1,736,006 69	Sierra	43,567 60
Los Angeles	2,054,979 32	Solano	1,004,529 22
Marin	694,323 43	Sonoma	1,213,493 80
Merced	744,702 00	Stanislaus	608,015 79
Monterey	734,772 69	Sutter	202,640 00
Napa	656,473 77	Tehama	821,502 56
Nevada	801,812 64	Tulare	1,169,500 04
Placer	2,322,169 36	Yolo	874,378 22
Sacramento	1,369,013 90	Yuba	410,798 58
San Benito	260,040 04		
		Total	$31,174,141 01

NOTE.—The statement of each railroad was made separately to the Assessor of each county, who, in entering the statements omitted the cents, which accounts for the discrepancy of $21 01 between the above amount and the aggregate of amounts that appear on the assessment books.

SCHEDULE II.

Showing, from Assessors' Reports, the Number of Miles, Value Per Mile of Franchise, Roadway, etc., of Railroads, etc., which were not Assessed by Board of Equalization, in 1880.

Names of Railroads not Assessed by the State Board of Equalization.	Number of Miles.	Value of Franchises, per Mile.	Value of Roadway, Roadbed, and Rails, per Mile.	Value of Rolling Stock.	Total Value of Roadway, Franchise, etc., of each Company.	Total Value in each County.
Alameda.						
Alameda Township—						
Alameda and Piedmont	2.750	$1 00	$1,000	$2,000	$4,755	
Bay and Coast	5.500	1 00	7,600		41,805	
Brooklyn Township—						
Brooklyn and Fruit Vale	2.125	1 00	1,000	1,000	3,001	
Fruit Vale and Mills Seminary	2 250	1 00	1,000	2,250	4,501	
Oakland and Fruit Vale	.875	1 00	2,857	1,200	3,751	
Eden Township—						
Bay and Coast	10.750	1 00	7,600		81,960	
Oakland Township—						
Berkeley Branch Northern Railway	4.660	82	3,133		14,603	
Washington Township—						
Bay and Coast	5.700	1 00	7,600		43,325	$151,141
Contra Costa.						
Black Diamond	5.750		4,500	10,005	35,880	
Empire	5.500		3,000	4,906	21,406	
Pittsburg	5.666		3,000	5,100	22,100	79,386
Humboldt.						
Hooper Bros.	1.750		7,028	700	13,000	
Vance, John	5.		2,500	5,000	17,000	
South Bay Railroad	4.		2,000	6,000	14,000	
Dolbeer & Carson	1.250		4,000	250	5,250	
Arcata Transportation	1.250		1,200	1,000	2,500	
Haney, Charles	1.250		80	None.	100	51,850
[The above are logging roads.]						
Los Angeles.						
Los Angeles and San Diego	27.080	2,000 00	10,800		346,624	

Los Angeles and Independence	14.200	10 00	7,000	22,150	121,692	468,316
Mendocino.						
Guallala Railroad	7.000		4,500	6,000	37,500	
Redwood Lumber Company	4,250		3,000	6,000	18,600	
Salmon Creek	8.		2,750	6,500	28,500	
Caspar Creek	3.250		2,400	2,600	9,600	
Noyo and Pudding Creek	2.		2,000		4,000	98,200
Monterey.						
Monterey Railroad	15.400	2,000 00	10,800		197,120	197,120
San Francisco.						
Street Railroads—single track	74.	12,174 00	1,756	173,100	* 1,355,000	1,355,000
Santa Clara.						
Market Street and Willow Glen—horse	2.800		1,526	3,250	7,575	
North Side—horse	2.		1,800	2,500	6,100	
Peoples—horse	5.250		2,500	6,850	18,875	
First Street—horse	1.500		2,500	1,800	5,550	
S. J. & S. C.—horse	5.		4,000	4,100	24,100	62,150
Santa Cruz.						
Santa Cruz and Felton	5.900		3,381	14,700	34,650	34,650
Sonoma.						
Sonoma Valley	7.	1 00	3,250	11,350	34,100	34,100
Tulare.						
Visalia Railroad	7.	125 00	800	* 600	10,085	10,085
Totals	257.656					$2,541,998

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* The total of preceding columns is $1,203,920. Probably there is an error in the columns, and the total is correct.

SAN FRANCISCO
PUBLIC LIBRARY

SCHEDULE I.

Showing from Assessor's July Statements the Amount of Solvent Credits Assessable, the Amount of Debts Due bona fide residents deducted therefrom, and the Amount of net Solvent Credits Actually Assessed in 1880.

COUNTIES.	Solvent Credits on Statement to Assessor.	Deductions of Debts due by Taxpayers.	Net Amount of Solvent Credits Assessed.	Percent. of Personal Property, exclusive of Money, to which Solvent Credits Amount.
Alameda	$364,517	$109,245	$348,187	7.59
Alpine	----------	----------	4,263	3.84
Amador	----------	----------	----------	----------
Butte	215,331	500	214,831	8.10
Calaveras	249,365	39,385	209,980	20.12
Colusa	1,156,288	522,280	634,008	23.36
Contra Costa	----------	----------	436,694	33.34
Del Norte	86,434	26,129	59,282	20.60
El Dorado	305,562	149,111	204,505	20.90
Fresno	56,539	----------	56,539	3.32
Humboldt	----------	----------	257,781	14.73
Inyo	93,450	40,423	53,027	10.94
Kern	453,941	386,422	67,519	4.91
Lake	111,193	11,279	99,914	16.08
Lassen	----------	----------	78,221	12.58
Los Angeles	----------	----------	221,650	7.92
Marin	----------	----------	303,776	21.22
Mariposa	5,365	86	269,321	52.14
Mendocino	----------	----------	399,812	18.50
Merced	----------	----------	43,650	3.39
Modoc	91,186	34,700	56,486	6.32
Mono	----------	----------	----------	----------
Monterey	347,214	88,294	258,920	16.39
Napa	1,222,674	780,299	442,375	22.22
Nevada	686,235	242,575	443,660	23.50
Placer	685,836	156,818	529,018	30.10
Plumas	50,000	25,000	25,000	4.12
Sacramento	----------	----------	1,246,880	20.14
San Benito	----------	----------	55,000	8.27
San Bernardino	----------	----------	78,389	11.31
San Diego	348,157	181,608	166.549	18.49
San Francisco	----------	----------	5,972.677	8.70
San Joaquin	----------	----------	1,176,440	24.51
San Luis Obispo	----------	----------	122,826	8.80
San Mateo	----------	----------	295,950	21.24
Santa Barbara	189,100	40,470	148,630	11.51
Santa Clara	----------	----------	1,164,738	27.01
Santa Cruz	----------	----------	162,534	14.00
Shasta	269,626	48,208	221,418	23.27
Sierra	----------	----------	193,649	36.31
Siskiyou	452,000	162,000	290,000	18.39
Solano	----------	----------	165,057	8.82
Sonoma	2,172,162	1,171,160	1,001,002	27.82
Stanislaus	375,980	181,531	194,449	11.66
Sutter	199,838	40,909	158,929	17.89
Tehama	792,000	612,000	180,000	15.34
Trinity	152,348	12,348	140,000	31.31
Tulare	167,317	9,797	157,520	11.38
Tuolumne	43,280	27,155	16,125	2.58
Ventura	182,411	66,185	116,226	13.53
Yolo	----------	----------	536,765	23.14
Yuba	401,530	96,925	304,605	18.41
Total	----------	----------	$19,984,777	13.35

NOTE.—No returns were made by the Assessors of the cases where the "Debts Due" equaled the "Solvent Credits." The total column only shows the net amount actually assessed.

SCHEDULE J.

Showing Assessed Value of Franchises and Shares of Capital Stock reported by Assessors for 1880.

Counties.		Assessed Value of Shares of Capital Stock.	Value of Franchises.
Alameda.	Alameda Township	$2,175 00	----
	Brooklyn Township	19,342 00	$203 00
	Eden Township	----	10 00
	Murray Township	----	----
	Oakland Township	97,227 00	3 00
	Washington Township	1,170 00	5 00
Alpine		----	----
Amador		----	----
Butte		750 00	----
Calaveras		----	----
Colusa		----	----
Contra Costa		----	----
Del Norte		----	----
El Dorado		4,125 00	200 00
Fresno		34,200 00	----
Humboldt		1,111 00	125 00
Inyo		1,725 00	1,600 00
Kern		150 00	----
Lake		1,060 00	----
Lassen		----	----
Los Angeles		15,867 00	58,328 00
Marin		40,450 00	12,500 00
Mariposa		5,365 00	1,400 00
Mendocino		----	----
Merced		5,000 00	20,100 00
Modoc		----	----
Mono		----	----
Monterey		----	30,800 00
Napa		61,856 00	----
Nevada		10,325 00	6,000 00
Placer.	District No. 1	4,670 00	----
	District No. 2	3,989 00	1,150 00
	District No. 3	16,330 00	----
Plumas		----	----
Sacramento		595,000 00	----
San Benito		----	----
San Bernardino		----	----
San Diego		16,090 00	5,000 00
San Francisco		5,544,233 00	*14,900,900 00
San Joaquin		527,930 00	----
San Luis Obispo		7,711 00	----
San Mateo		303,895 00	1,070,000 00
Santa Barbara		69,718 00	12,250 00
Santa Clara		272,000 00	180,000 00
Santa Cruz		19.799 00	----
Shasta		6,900 00	6,650 00
Sierra		----	----
Siskiyou		----	3,100 00
Solano		226,227 00	----
Sonoma		8,016 00	35,307 00
Stanislaus		14,870 00	----
Sutter		13,053 00	----
Tehama		51,200 00	500 00
Trinity		----	1,015 00
Tulare		35,740 00	----
Tuolumne		3,562 00	----
Ventura		5,138 00	----
Yolo		----	----
Yuba		101,360 00	----
Totals		$8,449,329 00	$16,347,146 00

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* The two principal assessments of franchises are San Francisco Gas Company and Spring Valley Water Company, each $7,000,000.

SCHEDULE K.

Showing Values of Property in Two Counties subject to One Mortgage, the Values of the Mortgage Apportioned by the State Board of Equalization, the Values of Mortgages and Properties, and Percentages.

Counties in which Property Subject to Mortgage is Situated.	Assessed Value of Property in both Counties.	Value of Mortgages.	Total Value of Properties.	Total Value of Mortgages.	Perc'tage of Value of Property to which the Loans Amount.	Percentage of excess of Value of Mortgage over Value of Property Mortgaged.
Alameda and Contra Costa	$575	$500				
Alameda and Contra Costa	2,500	2,100				
Alameda and Contra Costa	16,474	12,500				
Alameda and Contra Costa	19,750	25,600				
Alameda and Contra Costa	23,000	26,000				
Alameda and Contra Costa	65,905	39,000				
Alameda and Contra Costa	76,995	55,000				
Alameda and Contra Costa	101,486	70,000				
Alameda and Contra Costa	149,027	66,270				
Alameda and Contra Costa	212,136	110,000	$667,848	$406,370	60.84	
Alameda and San Francisco	985	1,000				
Alameda and San Francisco	1,275	1,000				
Alameda and San Francisco	3,100	1.286				
Alameda and San Francisco	3,420	2,700				
Alameda and San Francisco	2,670	3,020				
Alameda and San Francisco	11,350	10,000				
Alameda and San Francisco	11,820	10,000				
Alameda and San Francisco	14,400	13,000				
Alameda and San Francisco	17,350	10,000				
Alameda and San Francisco	17,700	3,000				
Alameda and San Francisco	18,555	22,500				
Alameda and San Francisco	23,500	26,812				
Alameda and San Francisco	28,635	26,822	154,760	131,140	84.73	
Alameda and Santa Clara	1,535	7,000				
Alameda and Santa Clara	14,942	10,000				
Alameda and Santa Clara	25,600	20,000	42.077	37.000	87.93	
Alameda and Yuba	8,100	10,000	8,100	10,000		23.45
Butte and Colusa	55,948	28,000				
Butte and Colusa	62,328	50,000	117.826	78,000	66.20	
Butte and Sutter	4,350	4,000				
Butte and Sutter	6,400	5,300				
Butte and Sutter	47,360	35,000	58,110	44,300	76.23	

Butte and Tehama	166,808	192,534				
Butte and Tehama	5,280	2,800	172,088	195,334		13.51
Butte and Yuba	2,100	3,000				
Butte and Yuba	5,900	2,500				
Butte and Yuba	10,500	14,000	18,500	19,500		5.40
Colusa and Merced	3,000	3,100	3,000	3,100		3.30
Colusa and Napa	45,860	50,000	45,860	50,000		9.02
Colusa and San Francisco	5,878	7,475	5,878	7,475		27.16
Colusa and Tehama	10,000	9,000				
Colusa and Tehama	11,700	3,000				
Colusa and Tehama	98,634	45,000	120,334	57,000	47.34	
Colusa and Yolo	1,321	1,484				
Colusa and Yolo	1,440	831				
Colusa and Yolo	2,240	3,523				
Colusa and Yolo	129,560	120,000	134,561	125,838	93.51	
Fresno and Merced	5,067	2,000				
Fresno and Merced	56,730	50,000	61,797	52,000	84.14	
Fresno and San Benito	725	1,800	725	1,800		148.27
Fresno and San Francisco	3,700	9,927	3,700	9,927		168.29
Fresno and Santa Clara	11,652	14,494	11,652	14,494		24.49
Fresno and Tulare	2,030	1,500				
Fresno and Tulare	1,996	2,050				
Fresno and Tulare	6,740	6,255				
Fresno and Tulare	27,760	10,000				
Fresno and Tulare	28,146	28,000	66,672	47,805	71.70	
Lassen and Tehama	12,000	7,000	12,000	7,000	58.33	
Los Angeles and San Diego	2,500	2,272	2,500	2,272	90.88	
Los Angeles and Santa Clara	1,462	1,200	1,462	1,200	82.08	
Los Angeles and Ventura	21,957	9,000				
Los Angeles and Ventura	18,902	23,000	40,859	32,000	78.31	
Marin and San Francisco	120,240	53,000	120,240	53,000	44.07	
Marin and Sonoma	3,770	1,762				
Marin and Sonoma	6,050	5,868				
Marin and Sonoma	6,350	3,320				
Marin and Sonoma	8,180	5,000				
Marin and Sonoma	10,484	7,000	34,834	22,950	65.88	
Marin and Sutter	3,557	3,000	3,557	3,000	84.21	
Mariposa and Merced	7,183	2,500				
Mariposa and Merced	7,324	3,962				
Mariposa and Merced	26,664	12,161	41,171	18,623	45.23	
Merced and San Francisco	6,840	6,500	6,840	6,500	95.02	
Merced and San Joaquin	9,160	8,000				
Merced and San Joaquin	31,039	12,000	40,199	20,000	49.75	

SCHEDULE K.—Continued.

COUNTIES IN WHICH PROPERTY SUBJECT TO MORTGAGE IS SITUATED.	Assessed Value of Property in both Counties.	Value of Mortgages.	Total Value of Properties.	Total Value of Mortgages.	Perc'tage of Value of Property to which the Loans Amount	Percentage of excess of Value of Mortgage over Value of Property Mortgaged.
Merced and San Luis Obispo	$38,748	$25,000	$38,748	$25,000	61.54	
Merced and Stanislaus	3,007	1,000				
Merced and Stanislaus	3,381	1,500				
Merced and Stanislaus	3,450	5,008				
Merced and Stanislaus	24,350	7,400				
Merced and Stanislaus	25,130	16,000				
Merced and Stanislans	34,500	20,000				
Merced and Stanislaus	80,000	19,000				
Merced and Stanislaus	157,795	11,000				
Merced and Stanislaus	157,812	54,000				
Merced and Stanislaus	187,178	91,000	676,603	225,908	33.38	
Monterey and San Benito	500	750				
Monterey and San Benito	700	700				
Monterey and San Benito	2,570	5,000				
Monterey and San Benito	5,995	3,000				
Monterey and San Benito	91,406	50,000	101,171	59,450	58.76	
Monterey and San Luis Obispo	9,860	10,000				
Monterey and San Luis Obispo	13,995	11,300	23,855	21,300	89.29	
Monterey and Santa Cruz	112,180	33,000	112,180	33,000	29.41	
Monterey and Ventura	13,995	18,800	13,995	18,800		34.34
Napa and San Francisco	5,986	7,000				
Napa and San Francisco	8,710	7,000	14,696	14,000	95.26	
Napa and Solano	6,835	7,000				
Napa and Solano	13,550	3,000	20,385	10,000	49.05	
Napa and Sonoma	1,580	1,300				
Napa and Sonoma	9,770	7,947	11,350	9,247	81.47	
Napa and Yolo	30,822	3,329	30,822	3,329	10.80	
Placer and Sacramento	17,185	4,000				
Placer and Sacramento	26,012	8,000				
Placer and Sacramento	95,340	64,000	138,537	76,000	54.85	
Placer and Sonoma	5,595	3,493	5,595	3,493	62.43	
Placer and Sutter	4,000	3,443				
Placer and Sutter	4,826	3,000				
Placer and Sutter	7,620	600	16,446	7,043	42.82	
Plumas and Yuba	20,550	10,000	20,555	10,000	48.66	
Sacramento and San Joaquin	6,300	5,400				
Sacramento and San Joaquin	15,900	8,000				

Sacramento and San Joaquin	23,000	16,000				
Sacramento and San Joaquin	25,320	29,500	70,520	58,900	83.53	
Sacramento and Sutter	9,666	7,457				
Sacramento and Sutter	17,088	33,000	26,754	40,457		51.21
San Benito and San Luis Obispo	365,795	243,000	365,795	243,000	66.43	
San Benito and Santa Clara	2,280	1,200				
San Benito and Santa Clara	16,799	14,000				
San Benito and Santa Clara	12,420	19,500				
San Benito and Santa Clara	105,339	35,000	136,838	69,700	50.93	
San Bernardino and San Diego	30,413	6,615	30,413	6,615	21.75	
San Francisco and San Mateo	595	750				
San Francisco and San Mateo	175	1,000				
San Francisco and San Mateo	3,347	6,000				
San Francisco and San Mateo	3,455	8,690				
San Francisco and San Mateo	6,525	5,918				
San Francisco and San Mateo	23,990	27,500				
San Francisco and San Mateo	73,660	121,000	114,747	170,858		48.89
San Francisco and Solano	1,150	900	1,150	900	78.26	
San Francisco and Sonoma	18,520	20,000	18,520	20,000		7.99
San Joaquin and Stanislaus	6,420	3,000				
San Joaquin and Stanislaus	29,750	7,000				
San Joaquin and Stanislaus	35,940	12,800	72,110	22,800	31.61	
San Mateo and Santa Clara	15,480	9,245				
San Mateo and Santa Clara	17,490	7,000				
San Mateo and Santa Clara	46,170	31,000				
San Mateo and Santa Clara	47,415	35,100				
San Mateo and Santa Clara	48,350	15,000				
San Mateo and Santa Clara	51,295	30,000	226,200	127,345	56.29	
Santa Clara and Santa Cruz	1,000	500				
Santa Clara and Santa Cruz	1,268	1,000				
Santa Clara and Santa Cruz	1,750	3,000				
Santa Clara and Santa Cruz	3,925	3,500				
Santa Clara and Santa Cruz	52,171	50,000				
Santa Clara and Santa Cruz	55,010	50,000	115,124	108,000	93.81	
Santa Cruz and Sonoma	1,375	2,000	1,375	2,000		45.45
Solano and Yolo	5,381	7,000	5,381	7,000		30.08
Stanislaus and Tuolumne	1,924	1,500				
Stanislaus and Tuolumne	11,625	5,000	13,549	6,500	47.97	
Stanislaus and Yolo	3,698	3,098	3,698	3,098	83.77	
Sutter and Yuba	2,834	3,500	2,834	3,500		23.50
General Totals			$4,427,091	$2,864,871	64.71	

Note.—The amount of all the mortgages is 64.71 per cent. of the assessed value of all the mortgaged property.

SCHEDULE L.

Showing the Value of Real Estate, City and Town Lots, and Improvements thereon, the per cent. of the Value of the same subject to Mortgages and Trust Deeds, the Number of Mortages and Trust Deeds, and Value of same for 1880.

COUNTIES.	No. of Mortgages.	Value of Mortgages Assessed.	Value of Real Estate, Lots and Improvements in County.	Per cent. of Value of Real Estate and improvements the Mortgages amount to.
Alameda	5,952	$12,430,196	$42,512,735	29.238
Alpine	6	5,814	251,249	2.314
Amador		312,987	1,982,672	15.789
Butte	540	2,410,722	9,111,738	26.457
Calaveras	164	119,634	1,510,350	7.920
Colusa.	1,037	3,323,787	14,416,726	23.055
Contra Costa	447	1,059,394	6,128.158	17.287
Del Norte	44	55,512	507,459	10.939
El Dorado	291	216,840	1,715,370	12.641
Fresno	261	363,685	4,315,500	8.427
Humboldt		1,010,291	4,727,588	21.370
Inyo	63	86,559	680,374	12.722
Kern	132	188.472	2,690,826	7.004
Lake	273	322.332	1,896,727	16.994
Lassen		104,801	664,094	15.781
Los Angeles	1,311	2.196,402	13,510,491	16.256
Marin	398	1,737,854	6,778,292	25.638
Mariposa	86	269,321	926,365	29.072
Mendocino		1,080,979	4,101,128	26.358
Merced		747,534	4,350,235	17.183
Modoc	132	82.944	932,438	8.895
Mono		33.578	1,521,591	2.206
Monterey	421	1,063.674	5,727,435	18.571
Napa	688	1,709.293	6,411,719	26.658
Nevada	448	508,408	6,189,358	8.214
Placer	113	384,099	3,802,220	10.101
Plumas	170	168,902	1,456,542	11.596
Sacramento	1,408	2,984,875	17,778,215	16.789
San Benito	322	719,825	2,978,969	24.163
San Bernardino		292,561	2,255,584	12.970
San Diego	186	312,772	1,649,250	18.958
San Francisco	16,500	36,879,517	164,998,508	22.351
San Joaquin		3,500,432	20,743,570	16.874
San Luis Obispo		517,484	3,267,454	15.837
San Mateo	392	1,286,735	5,979,655	21.518
Santa Barbara	471	742,144	4,157,695	17.849
Santa Clara	1,244	2,883,399	19,517,935	14.773
Santa Cruz	716	1,107,041	5,021,240	22.047
Shasta	166	230,061	1,424,173	16.154
Sierra	79	66,091	1,087,404	6.077
Siskiyou	206	441,626	2,034,002	21.712
Solano		2,105,246	9,061.943	23.231
Sonoma	1,394	3,126,360	13,600,733	22.986
Stanislaus	533	1,341,886	7,342,242	18.276
Sntter	448	1,355,583	4,091,030	33.135
Tehama	536	1,503.720	4,592.953	32.739
Trinity		57,610	606,001	9.506
Tulare	581	554,693	3,813,155	14.546
Tuolumne	165	142,971	1,312,938	10.889
Ventura	202	323,697	2,442,767	13.251
Yolo		1,845,988	9,254,176	19.947
Ynba	185	494,840	2,863,245	17.278
Totals		$96,811,171	$460,694,217	21.014

SCHEDULE M.

Showing Number of Acres and Average Value of same for 1879 *and* 1880.

Counties.	Number of Acres of Land, 1879.	Average Value per Acre, 1879.	Number of Acres of Land, 1880.	Average Value per Acre, 1880.
Alameda	413,889	$33 42	487,293	$26 20
Alpine	38,502	1 25	37,548	4 05
Amador	167,822	2 00	183,909	4 85
Butte	486,245	12 44	534,642	13 42
Calaveras	255,717	3 00	235,283	4 18
Colusa	1,052,773	9 18	933,506	13 91
Contra Costa	448,866	11 35	450,898	11 28
Del Norte	51,673	3 87	62,014	3 85
El Dorado	173,504	4 84	205,652	4 31
Fresno	1,631,972	2 21	1,729,999	2 13
Humboldt	754,799	2 90	780,619	3 95
Inyo	60,489	3 75	67,866	4 44
Kern	741,885	1 51	1,389,550	1 48
Lake	151,990	6 25	181,585	7 04
Lassen	155,820	2 33	127,488	3 20
Los Angeles	1,221,625	5 19	1,351,240	5 32
Marin	318,367	14 30	317,652	13 05
Mariposa	192,234	1 65	203,993	2 88
Mendocino	753,339	3 54	714,129	4 00
Merced	1,015,805	3 51	1,004,914	3 58
Modoc	162,418	2 20	213,998	2 63
Mono	66,773	7 57	78,602	6 57
Monterey	751,420	6 10	855,555	5 26
Napa	338.078	11 51	232.895	16 42
Nevada	202.684	2 45	219,204	18 26
Placer	320,923	3 10	335,743	6 67
Plumas	186,497	4 66	193,020	4 65
Sacramento	610,466	7 75	610,358	13 33
San Benito	312,550	8 00	311,675	7 59
San Bernardino	460,900	4 00	499,217	3 05
San Diego	1,277,384	1 00	900,454	99
San Francisco	6,862	171 00	6,897	168 32
San Joaquin	863,720	12 25	869,531	17 80
San Luis Obispo	1,011,285	2 23	1,085,955	2 28
San Mateo	296,059	14 42	293,973	13 50
Santa Barbara	858,063	3 17	989,369	2 81
Santa Clara	560,142	21 55	565,948	16 84
Santa Cruz	237,080	12 62	258,617	11 41
Shasta	112,987	3 30	254,093	3 63
Sierra	84,259	3 00	96,757	6 92
Siskiyou	204,771	3 66	209,672	5 92
Solano	503,267	10 62	503,394	13 85
Sonoma	727,919	10 00	748,674	11 78
Stanislaus	834,766	5 16	867,796	7 35
Sutter	371,158	7 34	371,426	9 74
Tehama	840,781	2 71	779,678	4 84
Trinity	73,880	2 14	82,335	4 66
Tulare	1,073,250	2 30	1,109,731	1 80
Tuolumne	178,440	2 76	183,644	3 24
Ventura	647.701	6 64	511,310	3 63
Yolo	547,148	12 45	538,448	13 85
Yuba	213,110	6 24	238,391	5 74
Totals	25,024,057	----------	26,116,080	$7 04

Note.—The first column states the number of acres reported by the Auditor. The second column is the statement by the Assessor for eighteen hundred and seventy-nine. The third column states the number of acres reported by the Auditor. The average value is found by dividing the value of the "Real Estate other than City and Town Lots," by the number of acres. The element of uncertainty is that in the mining counties the value of mines is set down, in the column in the assessment book, under "Real Estate."

SCHEDULE N.

Showing Values of Real Estate other than City Lots, and City and Town Lots, and the Improvements thereon, in the several Counties, for 1880.

Counties.	Value of Real Estate other than City and Town Lots.	Value of Improvements thereon.	Value of City and Town Lots.	Value of Improvements thereon.	Value of Improvements on Real Estate assessed to persons other than the owners of the Real Estate.	Total Value.
Alameda	$12,769,449	$1,960,142	$18,541,184	$9,156,696	$85,264	$42,512,735
Alpine	152,282	71,741	9,726	17,500	----------	251,249
Amador	893,221	594,596	107,348	354,685	32,822	1,982,672
Butte	7,178,309	654,984	501,573	763,592	13,280	9,111,738
Calaveras	983,008	294,128	41,391	170,078	21,745	1,510,350
Colusa	12,993,845	685,269	249,290	462,333	25,989	14,416,726
Contra Costa	5,089,426	595,592	175,083	261,612	6,445	6,128,158
Del Norte	235,952	136,087	36,485	97,190	1,745	507,459
El Dorado	887,065	412,055	100,215	255,190	60,845	1,715,370
Fresno	3,701,194	263,269	94,221	158,953	97,863	4,315,500
Humboldt	3,005,728	579,488	493,705	639,367	9,300	4,727,588
Inyo	301,843	266,123	19,705	89,175	3,528	680,374
Kern	2,057,190	382,152	109,565	117,369	24,550	2,690,826
Lake	1,278,482	405,418	60,343	147,709	4,775	1,896,727
Lassen	408,727	189,200	26,947	39,220	----------	664,094
Los Angeles	7,191,275	1,052,884	3,286,157	1,952,175	28,000	13,510,491
Marin	4,146,130	604,305	1,393,772	607,960	26,125	6,778,292
Mariposa	587,882	248,393	12,805	58,595	18,690	926,365
Mendocino	2,856,874	790,778	120,645	320,288	12,543	4,101,128
Merced	3,601,906	321,795	164,150	198,513	63,871	4,350,235
Modoc	564,379	268,962	15,851	83,246	----------	932,438
Mono	516,489	396,674	176,257	422,549	9,622	1,521,591
Monterey	4,500,689	457,676	406,020	342,670	20,380	5,727,435
Napa	3,824,640	1,125,368	632,245	817,781	11,685	6,411,719
Nevada	4,003,065	790,583	331,770	992,599	71,341	6,189,358
Placer	2,242,354	823,911	160,937	534,432	40,586	3,802,220
Plumas	898,646	358,312	32,362	131,312	35,910	1,456,542
Sacramento	8,141,680	1,188,865	3,603,190	4,820,055	24,425	17,778,215
San Benito	2,365,939	267,390	128,795	207,245	9,600	2,978,969
San Bernardino	1,527,293	416,961	141,714	166,150	3,466	2,255,584

San Diego	898,169	113,615	409,133	223,053	5,280	1,649,250
San Francisco	1,160,909	60,200	120,868,959	42,855,890	52,550	164,998,508
San Joaquin	15,482,399	975,328	2,139,763	2,073,942	72,138	20,743,570
San Luis Obispo	2,478,727	309,210	215,730	244,118	19,669	3,267,454
San Mateo	3,968,900	1,292,250	451,010	262,245	5,250	5,979,655
Santa Barbara	2,780,386	350,950	482,248	512,686	31,425	4,157,695
Santa Clara	9,534,658	1,770,339	5,044,743	3,127,770	40,425	19,517,935
Santa Cruz	2,952,015	485,274	852,518	731,433	------	5,021,240
Shasta	924,569	224,275	46,143	108,302	120,884	1,424,173
Sierra	669,864	210,610	23,495	181,560	1,875	1,087,404
Siskiyou	1,242,706	470,774	80,822	239,700	------	2,034,002
Solano	6,973,012	707,682	488,314	880,875	12,060	9,061,943
Sonoma	8,822,528	1,972,636	1,193,697	1,584,312	27,560	13,600,733
Stanislaus	6,384,590	418,660	173,952	333,140	31,900	7,342,242
Sutter	3,618,703	346,822	37,425	85,330	2,750	4,091,030
Tehama	3,769,157	279,502	208,113	320,069	16,112	4,592,953
Trinity	384,144	165,600	19,807	36,450	------	606,001
Tulare	1,808,212	1,499,388	141,717	243,640	120,198	3,813,155
Tuolumne	595,089	385,209	107,980	217,250	7,410	1,312,938
Ventura	1,860,838	206,803	186,021	155,971	33,134	2,442,767
Yolo	7,461,664	689,983	383,960	683,514	35,055	9,254,176
Yuba	1,369,845	312,963	382,248	793,629	4,560	2,863,245
Totals	$184,046,046	$29,851,174	$165,111,249	$80,281,118	$1,404,630	$460,694,217

SCHEDULE O.

Statement of the Values of the several classes of Property in the Counties of the State for 1880.

Counties.	The Value of Real Estate.	The Value of Improvements on Real Estate.	The Value of Personal Property exclusive of Money.	The Amount of Money.	Total of Preceding Columns.	Value of Railroads Assessed by State Board of Equalization.	The Total Value of all Property.
Alameda	$31,310,633	$11,202,102	$4,593,904	$289,056	$47,395,695	$1,902,753	$49,298,448
Alpine	162,008	89,241	110,807	4,643	366,699	----------------	366,699
Amador	1,000,569	982,103	776,158	29,557	2,788,387	84,000	2,872,387
Butte	7,679,882	1,431,856	2,652,114	114,568	11,878,420	1,019,674	12,898,094
Calaveras	1,024,399	485,951	1,043,341	45,788	2,599,479	8,837	2,608,316
Colusa	13,243,135	1,173,591	2,714,045	144,242	17,275,013	600,760	17,875,773
Contra Costa	5,264,509	863,649	1,309,686	41,125	7,478,969	692,095	8,171,064
Del Norte	272,437	235,022	287,728	25,063	820,250	----------------	820,250
El Dorado	987,280	728,090	978,325	87,625	2,781,320	208,413	2,989,733
Fresno	3,795,415	520,085	1,698,714	17,628	6,031,842	1,501,485	7,533,327
Humboldt	3,499,433	1,228,155	1,749,451	130,347	6,607,386	----------------	6,607,386
Inyo	321,548	358,826	484,479	12,809	1,177,662	----------------	1,177,662
Kern	2,166,755	524,071	1,374,557	52,492	4,117,875	1,736,006	5,853,881
Lake	1,338,825	557,902	621,133	38,414	2,556,274	----------------	2,556,274
Lassen	435,674	228,420	621,476	17,860	1,303,430	----------------	1,303,430
Los Angeles	10,477,432	3,033,059	2,798,393	138,789	16,447,673	2,054,979	18,502,652
Marin	5,539,902	1,238,390	1,431,207	20,709	8,230,208	694,322	8,924,530
Mariposa	600,687	325,678	516,459	22,869	1,465,693	----------------	1,465,693
Mendocino	2,977,519	1,123,609	2,160,699	112,156	6,373,983	----------------	6,373,983
Merced	3,766,056	584,179	1,285,573	60,906	5,696,714	744,702	6,441,416
Modoc	580,230	352,208	892,629	17,991	1,843,058	----------------	1,843,058
Mono	692,746	828,845	797,905	45,943	2,365,439	----------------	2,365,439
Monterey	4,906,709	820,726	1,579,416	35,251	7,342,102	734,772	8,076,874
Napa	4,456,885	1,954,834	1,990,131	124,338	8,526,188	656,473	9,182,661
Nevada	4,334,835	1,854,523	1,887,315	183,505	8,260,178	801,812	9,061,990
Placer	2,403,291	1,398,929	1,757,777	117,177	5,677,174	2,322,169	7,999,343
Plumas	931,008	525,534	606,276	37,484	2,100,302	----------------	2,100,302
Sacramento	11,741,870	6,033,345	6,188,105	412,860	24,379,180	1,369,013	25,748,193
San Benito	2,494,734	484,235	676,541	23,385	3,678,895	260,040	3,938,935

San Bernardino	1,669,007	586,577	692,604	12,402	2,960,590	720,156	3,680,746
San Diego	1,307,302	341,948	900,748	20,838	2,570,836	2,424,633	4,995,469
San Francisco	122,029,868	42,968,640	68,583,967	19,747,623	253,330,098	190,228	253,520,326
San Joaquin	17,622,162	3,121,408	4,799,557	235,654	25,778,781	1,684,534	27,463,315
San Luis Obispo	2,694,457	572,997	1,395,711	14,883	4,678,048		4,678,048
San Mateo	4,419,910	1,559,745	1,392,710	22,445	7,394,810	369,800	7,764,610
Santa Barbara	3,262,634	895,061	1,290,594	38,764	5,487,053		5,487,053
Santa Clara	14,579,401	4,938,534	4,311,119	350,403	24,179,457	1,351,266	25,530,723
Santa Cruz	3,804,533	1,216,707	1,160,922	102,536	6,284,698	311,814	6,596,512
Shasta	970,712	453,461	951,129	57,312	2,432,614	380,963	2,813,577
Sierra	693,359	394,045	533,270	77,296	1,697,970	43,567	1,741,537
Siskiyou	1,323,528	710,474	1,576,491	114,364	3,724,857		3,724,857
Solano	7,461,326	1,600,617	1,869,928	188,176	11,120,047	1,004,529	12,124,576
Sonoma	10,016,225	3,584,508	3,597,396	394,231	17,592,360	1,213,493	18,805,853
Stanislaus	6,558,542	783,700	1,667,594	113,095	9,122,931	608,015	9,730,946
Sutter	3,656,128	434,902	888,146	20,974	5,000,150	202,640	5,202,790
Tehama	3,977,270	615,683	1,173,333	39,575	5,805,861	821,502	6,627,363
Trinity	403,951	202,050	447,000	40,938	1,093,939		1,093,939
Tulare	1,949,929	1,863,226	1,383,943	42,291	5,239,389	1,169,499	6,408,888
Tuolumne	703,069	609,869	623,427	40,207	1,976,572		1,976,572
Ventura	2,046,859	395,908	859,011	30,201	3,331,979		3,331,979
Yolo	7,845,624	1,408,552	2,319,274	462,122	12,035,572	874,378	12,909,950
Yuba	1,752,093	1,111,152	1,653,789	107,420	4,624,454	410,798	5,035,252
Totals	$349,157,295	$111,536,922	$149,656,007	$24,678,330	$635,028,554	$31,174,120	$666,202,674

N. B.—In total of Railroad Assessment, $21 01 is lost on fractions of cents not put on the assessment book.

SCHEDULE P.

Showing the Increase and Decrease in the several Counties in the Assessment in 1880, as Compared with the Assessment in 1879 of the several classes of Property, exclusive of the Railroad Property Assessed by the Board.

COUNTIES.	REAL ESTATE.		IMPROVEMENTS.		PERSONAL PROPERTY.		MONEY.	
	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.
Alameda	$2,298,327 00		$494,527 00		$1,113,868 00		$204,921 00	
Alpine	33,077 00			$29,279 00		$37,220 00	1,088 00	
Amador	107,160 00			18,932 00	114,789 00		17,262 00	
Butte	884,219 00		72,237 00		1,044,725 00		63,058 00	
Calaveras	229,115 00		24,270 00		510,222 00		32,808 00	
Colusa	3,554,546 00		105,663 00		1,183,154 00		103,373 00	
Contra Costa		$62,760 00	4,259 00		359,571 00		16,229 00	
Del Norte	40,940 00		32,948 00		60,122 00		16,439 00	
El Dorado	155,510 00		88,890 00		289,335 00		35,885 00	
Fresno	148,128 00		45,305 00		436,271 00		1,809 00	
Humboldt	802,502 00		31,525 00		305,352 00		60,275 00	
Inyo	57,553 00		9,507 00		21,613 00		10,659 00	
Kern	498,773 00		83,149 00		532,658 00		39,866 00	
Lake	307,424 00		440 00		107,667 00		21,253 00	
Lassen	45,904 00		7,897 00		33,755 00		3,112 00	
Los Angeles	376,854 00		378,164 00		518,097 00		31,981 00	
Marin	366,570 00		20,830 00		362,825 00		3,409 00	
Mariposa	40,238 00		4,852 00		118,452 00		8,394 00	
Mendocino	175,183 00		25,212 00		500,948 00		86,790 00	
Merced	201,238 00		36,634 00		41,782 00		25,732 00	
Modoc	210,536 00		101,396 00		193,931 00		11,605 00	
Mono	120,996 00		273,420 00		265,106 00		14,138 00	
Monterey	151,890 00		79,436 00		411,907 00		16,495 00	
Napa	111,585 00			115,086 00	776,156 00		86,290 00	
Nevada	958,635 00		193,033 00		725,360 00		138,030 00	
Placer	381,500 00		342,202 00		825,247 00		64,548 00	
✓ Plumas	43,375 00		14,029 00		97,311 00		25,338 00	
Sacramento	4,577,125 00			104,885 00	2,363,627 00			$291,215 00
San Benito		15,137 00	17,140 00		134,348 00		10,457 00	
San Bernardino	251,634 00		156,134 00		304,738 00			788 00

San Diego	47,677 00		21,140 00		482,649 00			14,331 00
San Francisco		1,020,192 00		346,300 00	25,025,827 00		12,358,988 00	
San Joaquin	5,707,602 00			26,350 00	2,241,285 00		121,680 00	
San Luis Obispo	156,763 00			7,806 00	405,436 00		8,821 00	
San Mateo		66,455 00	735,865 00		761,132 00		20,945 00	
Santa Barbara	955,367 00		309,121 00		486,934 00		10,242 00	
Santa Clara		1,223,314 00		10,596 00	1,463,907 00		146,983 00	
Santa Cruz	168,774 00		92,081 00		427,085 00		55,164 00	
Shasta	610,724 00			204,523 00	234,173 00		16,884 00	
Sierra	13,219 00		3,295 00		211,558 00		61,131 00	
Siskiyou	363,303 00		165,965 00		485,976 00		47,401 00	
Solano	2,258,660 00		229,033 00		311,375 00		159,791 00	
Sonoma	1,297,949 00		361,634 00		1,267,830 00		273,955 00	
Stanislaus	2,600,479 00		126,820 00		422,022 00		84,332 00	
Sutter	859,192 00		6,552 00		338,915 00		20,224 00	
Tehama	1,858,561 00			409,187 00	387,952 00		19,235 00	
Trinity	8,260 00		21,249 00		148,432 00		17,388 00	
Tulare		429,315 00	863,992 00		574,179 00		20,030 00	
Tuolumne	124,569 00		50,844 00		117,660 00		19,288 00	
Ventura	54,934 00		8,743 00		357,103 00		16,910 00	
Yolo	1,049,090 00		56,977 00		1,022,526 00		435,772 00	
Yuba	141,408 00			230,843 00	585,107 00		51,270 00	
Totals	$35,407,068 00	$2,817,173 00	$5,696,410 00	$1,503,787 00	$51,512,000 00	$37,220 00	$15,117,678 00	$306,334 00

Note.—To ascertain the true assessment of property in 1879, we deducted from the assessment of real estate the value of the roadways, and from personal property the value of rolling stock, which this year were assessed by the Board, but last year by Assessors. We believe that in some few of the counties Assessors placed assessment of roadways in "Improvement" column, but we have supposed that in nearly all cases the assessment was in the Real Estate column.

SCHEDULE R.

Showing Total Increase of Assessment of Property in 1880 over 1879, and in what Classes of Property the Increase Occurs.

Classes of Property.		Amounts.	Increase.
REAL ESTATE.			
Assessment of 1880		$349,157,295 00	
Assessment of 1879	$329,213,192 00		
Deduct roadways of 1879 assessed	12,645,792 00	316,567,400 00	
Increase			$32,589,895 00
IMPROVEMENTS.			
Assessment of 1880		$111,536,922 00	
Assessment of 1879		107,344,299 00	
Increase			4,192,623 00
PERSONAL PROPERTY.			
Assessment of 1880		$149,656,007 00	
Assessment of 1879	$101,198,292 00		
Deduct rolling stock assessed	3,017,065 00	98,181,227 00	
Increase			51,474,780 00
MONEY.			
Assessment of 1880		$24,678,330 00	
Assessment of 1879		9,866,986 00	
Increase			$14,811,344 00

RAILROADS.

Roadbed and roadway assessment by Board, 1880	$21,262,648 00		
Roadbed and roadway assessment, 1879	12,645,792 00		
Increase		$8,616,856 00	
Rolling stock assessment by Board, 1880	$6.506,252 00		
Rolling stock assessment, 1879	3,017,065 00		
Increase		3,489,187 00	
Add franchises assessed by Board of Equalization, 1880		3,405,220 00	
Increase in railroad assessment			15,511,263 00
Total increase of assessment of 1880			$118,579,905 00
Total State assessment for 1880		$666,202,674 00	
Total State assessment for 1879		547,622,769 00	
Increase			$118,579,905 00

SCHEDULE S.

Showing the Number of Tracts of Land Held and Assessed in the State, the Total Number of Acres in each class, and the Average Value per Acre. Compiled from Assessors' Reports for 1880.

Counties.		Ten Acres and Less.			From Ten to Forty Acres, Inclusive.			From Forty to Sixty Acres, Inclusive.		
		No. of Tracts in this Class.	Total Number of Acres.	Average Value per Acre.	No. of Tracts in this Class.	Total Number of Acres.	Average Value per Acre.	No. of Tracts in this Class.	Total Number of Acres.	Av'ge Value per Acre.
Alameda	Alameda Township		828	$768 17		928	$185 64		148	$11 21
	Brooklyn Township	182		199 44	91		157 02	20		155 57
	Murray Township		189	39 00		1,327	11 50		606	18 25
	Washington Township		629	86 56		2,984	59 89		2,198	51 72
Alpine										
Amador										
Butte		30		30 00	30		30 00	20		30 00
Calaveras		25	141	4 48	119	3,381	2 70	33	1,486	2 35
Colusa			291	28 59		21,164	8 27		6,342	14 04
Contra Costa			1,000	99 72		10,000	26 00		2,500	24 00
Del Norte										
El Dorado		65	570,555	14 20	159	543,431	5 12	48	453,006	3 73
Fresno										
Humboldt										
Inyo			124	35 38		280	8 34		604	3 78
Kern		14	38	10 70	59	1,692	3 34	6	276	4 09
Lake			80	26 14		1,183	9 49		3,584	7 98
Lassen		90		160 00	30		40 00	16		32 00
Los Angeles		754		22 97	1,563		16 63	303		16 10
Marin		79		153 58	80		50 37	28		26 54
Mariposa		21		3 58	37		1 83	4		3 43
Mendocino		94			167			42		
Merced		None.			29		7 00	9		6 00
Modoc			330	48 00		1,645	15 25		3,720	8 00
Mono										12 09
Monterey		140		56 60	143		26 71	130		28 84
Napa		139		67 64	298		32 05	125		
Nevada										
Placer	District No. 1	23		17 12	196		6 50	128		8 25
	District No. 2	12			49			22		
Plumas			1,200			2,136			2,600	

Sacramento		750	80 00		3,280	70 00		5,580	35 00
San Benito									
San Bernardino		575	500 00		3,654	35 00		2,356	18 00
San Diego		840			9,722			1,650	
San Francisco		240	324 00		850	213 79		473	289 64
San Joaquin	143		68 59	140		17 89	64		39 89
San Luis Obispo	20		26 60	41		14 78	24		12 30
San Mateo	172		88 60	233		42 75	103		28 65
Santa Barbara		1,564	32 27		19,372	10 42		7,683	14 18
Santa Clara	598			448			208		
Santa Cruz	508	4,252	82 00	250	9,450	61 00	193	9,652	45 00
Shasta	14	94	17 77	150	5,442	3 41	39	2,073	5 83
Sierra		70	56 93		250	8 78		620	3 16
Siskiyou									
Solano		6,000	65 00		10,000	50 00		12,000	45 00
Sonoma		2,100	100 00		10,990	40 00		15,550	20 00
Stanislaus									
Sutter	22	163	20 40	268	9,278	10 40	59	2,969	13 00
Tehama									
Trinity									
Tulare	18		45 09	64		15 27	13		9 83
Tuolumne									
Ventura									
Yolo		175,826			88,308			106,087	
Yuba									
Totals									

Schedule S.—Continued.

Counties.		From Sixty to One Hundred Acres, Inclusive.			From One Hundred to One Hundred and Sixty Acres, Inclusive.			From One Hundred and Sixty to Two Hundred and Forty Acres, Inclusive.		
		No. of Tracts in this Class.	Total Number of Acres.	Average Value per Acre.	No. of Tracts in this Class.	Total Number of Acres.	Average Value per Acre.	No. of Tracts in this Class.	Total Number of Acres.	Av'ge Value per Acre.
Alameda.	Alameda Township		654	$17 71		1,220	$96 24		946	$41 69
	Brooklyn Township	18		130 57	20		78 80	4		65 80
	Murray Township		13,060	7 00		39,475	6 50		7,706	9 75
	Washington Township		7,077	44 02		11,074	31 96		10,567	34 16
Alpine										
Amador										
Butte		131		32 00	383		20 00	51		30 00
Calaveras		151	12,068	1 92	888	135,452	1 71	184	30,865	1 72
Colusa			66,124	12 17		183,740	11 26		80,840	13 43
Contra Costa			5,000	25 00		146,000	12 00		50,360	10 50
Del Norte										
El Dorado		134		2 83	280		2 63	99		2 77
Fresno										
Humboldt										
Inyo			2,860	3 44		32,461	4 71		1,369	3 08
Kern		110	8,822	3 66	224	36,242	2 47	31	6,768	3 85
Lake			7,707	11 38		19,160	6 92		41,167	4 35
Lassen		12		5 00	23		4 00	188		2 40
Los Angeles		472		12 82	502		6 86	157		9 68
Marin		44		34 12	78		18 37	61		17 91
Mariposa		21		1 55	246		1 76	35		1 86
Mendocino		217			1,024			267		
Merced		21		7 00	105		5 00	37		6 00
Modoc			24,800	4 50		91,083	2 60		16,560	2 50
Mono										
Monterey		211		14 03	332		10 63	252		7 31
Napa		193		22 58	451		9 19	187		14 71
Nevada										
Placer	District No. 1	480		3 92	296		4 09	43		4 00
	District No. 2	92			102			85		
Plumas			3,400			19,000			25,000	
Sacramento			18,115	30 00		102,665	20 00		39,727	15 00

San Benito									
San Bernardino		7,752	8 00		14,690	5 00		15,604	3 50
San Diego		13,993			114,494			12,141	
San Francisco		620	132 40		757	154 26		791	129 78
San Joaquin	208		30 83	861		23 24	358		25 90
San Luis Obispo	55		8 90	141		4 02	62		5 17
San Mateo	137		16 18	184		18 25	213		11 93
Santa Barbara		31,516	5 34		50,692	5 24		32,981	3 92
Santa Clara	332			532			234		
Santa Cruz	265	24,830	31 00	347	48,603	10 00	211	46,257	7 00
Shasta	145	11,888	3 77	290	43,258	2 97	82	16,822	4 08
Sierra		3,474	2 59		3,092	1 96		33,465	2 13
Siskiyou									
Solano		15,000	30 00		25,040	25 00		55,350	20 00
Sonoma		70,395	10 00		121,273	10 00		137,442	9 00
Stanislaus									
Sutter	486	38,601	11 60	740	120,354	12 25	156	34,623	10 54
Tehama									
Trinity									
Tulare	378		7 16	473		4 03	287		3 22
Tuolumne									
Ventura									
Yolo		33,609			1,022			148,608	
Yuba									
Totals									

SCHEDULE S.—Continued.

Counties.		From Two Hundred and Forty to Three Hundred and Twenty Acres, Inclusive.			From Three Hundred and Twenty to Four Hundred Acres, Inclusive.			From Four Hundred to Six Hundred and Forty Acres, Inclusive.		
		No. of Tracts in this Class.	Total Number of Acres.	Average Value per Acre.	No. of Tracts in this Class.	Total Number of Acres.	Average Value per Acre.	No. of Tracts in this Class.	Total Number of Acres.	Av'ge Value per Acre.
Alameda	Alameda Township		272	$10 00					1,967	$24 04
	Brooklyn Township	14		34 56	7		$20 87	16		19 28
	Murray Township		24,236	8 00		91,891	8 00		44,656	5 75
	Washington Township		13,964	19 52		6,952	25 93		36,424	18 09
Alpine										
Amador										
Butte		80		32 00	83		31 00	75		8 00
Calaveras		51	15,268	2 08	32	7,457	1 91	49	24,348	2 02
Colusa			92,382	22 59		78,931	12 92		369,225	14 72
Contra Costa			75,005	11 00		40,000	12 00		120,000	8 00
Del Norte										
El Dorado		71		2 78	37		2 60	144		2 52
Fresno										
Humboldt										
Inyo			11,460	3 53		760	1 25		11,737	2 94
Kern		56	17,262	3 03	8	2,900	2 64	114	1,299,499	1 40
Lake			17,485	6 30		25,517	4 21		65,702	4 36
Lassen		26		2 00	78		2 00	113		1 50
Los Angeles		122		6 96	80		6 42	1,727		3 74
Marin		70		16 59	94		16 51	432		12 81
Mariposa		76		1 76	22		1 94	196		1 71
Mendocino		319			164			617		
Merced		64		5 50	11		5 00	64		6 00
Modoc			16,220	1 75		10,620	1 23		27,600	1 12
Mono										
Monterey		132		6 92	189		6 85	918		4 25
Napa		161		11 62	86		10 02	231		7 52
Nevada										
Placer	District No. 1	161		5 50	132		5 00	72		7 23
	District No. 2	44			25			78		
Plumas			27,000			30,000			83,000	
Sacramento			43,685	16 00		40,781	15 00		355,605	10 00

San Benito									
San Bernardino		34,918	3 00		25,693	5 00		401,078	3 00
San Diego		26,210			22,383			663,485	
San Francisco		615	259 51		400	160 00		1,907	125 47
San Joaquin	497		18 58	208		19 33	695		11 82
San Luis Obispo	53		2 95	36		5 16	62		3 61
San Mateo	99		17 91	113		12 45	276		11 63
Santa Barbara		55,701	2 76		39,216	3 36		646,496	2 14
Santa Clara	122			58			80		
Santa Cruz	98	29,464	4 00	49	19,600	5 00	103	59,458	3 00
Shasta	76	22,852	3 14	30	15,836	3 99	225	132,986	2 78
Sierra		3,085	2 12		9,023	2 19		44,922	2 00
Siskiyou									
Solano		80,000	15 00		180,000	10 00		120,004	3 00
Sonoma		62,205	14 00		67,429	9 50		267,390	7 00
Stanislaus									
Sutter	228	71,062	9 68	26	9,785	7 61	147	84,591	5 05
Tehama									
Trinity									
Tulare	190		2 80	87		2 32	1,727		2 33
Tuolumne									
Ventura									
Yolo									
Yuba									
Totals									

REMARKS BY THE ASSESSORS.

ALAMEDA.

Assessor of Oakland Township writes that the average value of land per acre in the township is $300 82.

ALPINE.

Impossible to separate the lands into different grades, as a large area of the county is possessory claims, nearly all grazing land, mountainous and wooded, and upon which no fixed value can be placed.

LOS ANGELES.

In the subdivision of land, 100 to 160 acres, the average of $6 86 per acre is not a fair expression of the average of land actually owned, inasmuch as included necessarily in this subdivision are the possessory claims on government land, the interest of the preëmptor therein being assessed at an average approximating 75 cents per acre.

MARIN.

Subdivisions "320 to 400," and "400 to 640," contain about 5,500 acres of swamp and overflowed land, unreclaimed, and tide lands, that are assessed at from $1 to $4 per acre; also, about 3,000 acres of chapperal lands, assessed at $1 25 per acre, which materially lessen the average of good land per acre.

MERCED.

Individual taxpayers hold in tracts less than 640 acres each, aggregating 79,420 acres. The remainder of the lands is held in tracts varying from 640 acres up to 25,000, and above 25,000 acres is one tract of 79,000 acres, and another of 204,000 acres.

I have valued lands all the way from $1 to $17 per acre; rating the best farming lands from $8 to $17 per acre, but have not had the time to classify and report the number of acres in each class.

MONTEREY.

Possessory rights are 434 in number, and are valued at $1 25 per acre.

PLACER, DISTRICT NO. 3.

Assessor notes in the space in the blank for reports of number of acres, etc., "None," yet he reports real estate other than city lots and mines, to the value of $16,536, showing that there is land in his district assessed by the acre.

SAN FRANCISCO.

The Assessor reports 6,653 acres; average value, $174 49. The Auditor reported 6,897 acres, and the Board estimated the average value at $168. The Assessor says: "The above 6,653 acres is a true statement of 'Land in Acres,' but the Auditor in his estimate has included 244 acres additional, which are assessed in 'City Lots.' They were included in acres by the Auditor, because they were in from one to five acres, and were in 'lots.'"

SAN JOAQUIN.

Tracts of from "400 to 640" acres include nearly all the swamp and overflowed lands, hence the low figure at which the lands in that class are assessed.

SANTA CLARA.

"There are 35 tracts of over 640 acres."

Note.—The Assessor fails to give the average value per acre of this or any other class of lands.

SUTTER.

There are over 100,000 acres of swamp and overflowed lands, which were assessed at $2 50 per acre, which makes my total average seem low. He reports 371,426 acres, general average per acre, $9 74.

SAN LUIS OBISPO.

There are 129 tracts of over 640 acres each, average value per acre, $2 15.

REMARKS BY BOARD.

The Board prepared blanks for the Assessors upon which to make their July statements. On these blanks was a ruling headed, "Number of Subdivisions of Land," "Class," "Number," and "Average per Acre."

Under the word "Class," was the statement of the class, as one to ten acres, ten to forty acres, and so on. Under word "Number," it was intended to have placed the number of the tracts in the class on the line opposite the designation of the class. In the next column was to appear the average value of each class of land per acre.

It was the purpose of the Board to prepare a table showing the number of the separate tracts of land assessed in the State, the number of each class, and the average value per acre of each class. It was hoped to deduce from such a table, first, whether the provisions in the law and Constitution providing for the assessment of lands in tracts of six hundred and forty acres each, had the effect of increasing the assessed valuation of land held in such large tracts. Second, whether the average value of small farms was greater, per acre, than large farms, and if so, the percentage of increased value; and thirdly, what was the relation in respect to the number of holdings between the large and small tracts of land.

A table containing the facts sought to be stated would be studied with keen interest, and would be of much value for future reference and comparison.

In respect to presenting a general view of the condition of the State, it is comparatively valueless, though there are some parts contained in it which will be of value to the statistician, while it is a forcible witness to the difficulty the Board has had to contend with in obtaining the statistics of the State.

It will be seen that owing to a misunderstanding on the part of some Assessors, who were willing to perform the labor, as to the meaning of the word "Number," and to the willful and inexcusable neglect on the part of other Assessors, the purpose of the table has utterly failed.

It will be perceived that the Assessor of Oakland and Eden Townships, Alameda County, and of District Number Three, Placer County, and the Assessors of Alpine, Amador, Del Norte, Fresno, Humboldt, Mono, San Benito, Siskiyou, Stanislaus, Tehama, Trinity, Tuolumne, Ventura, and Yuba Counties, failed to make any report.

The Assessors of Mendocino, Plumas, San Diego, Santa Clara, and Yolo Counties, and District Number Two, Placer County, failed to state the average value per acre of each class.

In an interview with the Assessor of Nevada County, he stated that over 40,000 acres were held by the Central Pacific Railroad Company, which were assessed in sections and fractions of sections, at an average value of $2 50. Large tracts of timber land were held by lumbering companies. That this year he is not prepared to make the statement so as to show the classes of agricultural land, but that next year he will be able to comply with the request of the Board.

The other Assessors, in spirit, and some in letter, complied with the requests of the Board.

SUMMARIZED STATEMENT

OF

Reports of Assessors for 1880.

NOTE.—The critical eye will detect many discrepancies, doubtless, in the following table, *e. g.* in some instances the product of the average value multiplied by the number of the kind will not agree with the total value stated by the Assessor. We did not have the time to correct the table, as any incorrectness could only be ascertained by correspondence with Assessors. The Board is not responsible for the defects in the table.

SCHEDULE T.

Showing the kinds of Personal Property, and the Assessed Value of each kind, in the several Counties, in the year 1880.

COUNTIES.	State, County, or Municipal Bonds.	Jewelry or Plate—Total Value.
Alameda	$685 00	$26,380 00
Alpine		135 00
Amador		
Butte	114.568 00	5,000 00
Calaveras	28,700 00	1,344 00
Colusa	39,500 00	3,454 00
Contra Costa		1,625 00
Del Norte	3,839 00	752 00
El Dorado		3,070 00
Fresno		1,880 00
Humboldt	4,279 00	3,246 00
Inyo	5,300 00	415 00
Kern		1,664 00
Lake	3,915 00	939 00
Lassen		200 00
Los Angeles	3,305 00	7,585 00
Marin		5,805 00
Mariposa	5,104 00	661 00
Mendocino		2,671 00
Merced	65,061 00	1,740 00
Modoc		760 00
Mono		1,450 00
Monterey	15,750 00	16,500 00
Napa	60,775 00	8,040 00
Nevada	68,725 00	7,505 00
Placer	49.206 00	5,215 00
Plumas	50,000 00	2,000 00
Sacramento		8,490 00
San Benito	300 00	200 00
San Bernardino		800 00
San Diego	14,095 00	1,620 00
San Francisco	2,311,500 00	324,719 00
San Joaquin	29,470 00	6,078 00
San Luis Obispo		1,210 00
San Mateo		7,025 00
Santa Barbara		2,336 00
Santa Clara	15,000 00	10,450 00
Santa Cruz	750 00	3,300 00
Shasta		2,950 00
Sierra	1,500 00	900 00
Siskiyou		
Solano	55,839 00	
Sonoma	200 00	7,020 00
Stanislaus	176 00	6,668 00
Sutter		690 00
Tehama		
Trinity		1,417 00
Tulare	6,670 00	350 00
Tuolumne	3,562 00	
Ventura		1,565 00
Yolo		2,030 00
Yuba	82,325 00	10,735 00
Totals	$3,040,099 00	$510,589 00

Schedule T.—Continued.

Counties.	Horses—Thoroughbred.			Horses—Graded.			Horses—American.		
	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.
Alameda	30	$586 66	$17,600 00	1,288	$31 28	$40,300 00	5,850	$41 83	$244,761 00
Alpine				224	53 00	12,040 00			
Amador									
Butte	4	400 00	1,600 00	450	150 00	67,500 00	5,604	60 00	326,240 00
Calaveras	10	250 00	2,500 00				1,092	47 00	51,683 00
Colusa	10	250 00	2,500 00				1,842	78 97	145,503 00
Contra Costa	4	1,025 00	4,100 00	2,100	30 50	64,050 00	3,950	52 50	205,400 00
Del Norte							264	46 78	12,250 00
El Dorado							706	74 47	52,580 00
Fresno				2,144		72,083 00	479		30,255 00
Humboldt				3,709	24 30	90,113 00	305	48 70	14,855 00
Inyo	1	200 00	200 00				289	64 58	18,797 00
Kern	10	385 00	3,850 00	2,365	25 00	59,125 00	423	57 00	24,111 00
Lake	1		230 00	990	32 64	32,353 00	1,039	52 23	54,270 00
Lassen				4,374	15 38	67,287 00	610		38,316 00
Los Angeles	60	190 83	11,450 00	2,255	33 67	75,926 00	1,118	54 24	60,640 00
Marin	6	429 16	2,575 00	1,478	29 03	42,917 00	537	73 84	39,655 00
Mariposa				1,475	26 52	39,124 00	71	55 35	3,930 00
Mendocino	9		1,850 00				1,559		94,575 00
Merced	7	220 00	1,550 00				816	76 00	62,022 00
Modoc	29	157 00	4,550 00	4,982	35 00	174,746 00			
Mono	4		2,000 00	1,560	50 00	78,000 00	380	100 00	38,000 00
Monterey				15	250 00	2,950 00	675	60 00	40,500 00
Napa	7	157 14	1,100 00	2,193	27 26	59,781 00	1,642	60 37	99,130 00
Nevada	1	200 00	200 00				866	72 05	62,395 00
Placer	4		1,000 00	246		13,128 00	1,146	62 63	71,785 00
Plumas	25	80 00	2,000 00	900	25 00	22,500 00	850	40 00	34,000 00
Sacramento	83	145 50	12,075 00				5,055	75 00	379,125 00
San Benito	3	200 00	600 00				1,830	54 00	98,820 00
San Bernardino	5	200 00	1,000 00	2,865	24 00	68,760 00	710	58 00	41,180 00
San Diego	5		750 00				317		16,517 00
San Francisco							10,774		712,250 00

San Joaquin	74	235·04	17,393 00				4,412	53 23	234,867 00
San Luis Obispo				4,349	25 62	86,361 00	606	55 28	33,500 00
San Mateo	39	393 59	15,350 00	1,828	24 89	45,510 00	1,019	58 00	59,185 00
Santa Barbara							860	58 82	50,589 00
Santa Clara	37	400 00	14,800 00				3,525	50 00	176,250 00
Santa Cruz	2	150 00	300 00	740	45 00	33,300 00	1,418	39 05	45,376 00
Shasta				6	150 00	900 00	757	56 82	43,015 00
Sierra	5	210 00	1,050 00	679	28 69	19,483 00	95	59 57	5,660 00
Siskiyou							500	50 00	25,000 00
Solano							4,260	41 57	177,094 00
Sonoma	31	500 00	14,300 00	3,520	30 00	105,500 00	3,400	60 00	201,030 00
Stanislaus				5,530	39 00	215,670 00	572	93 00	53,196 00
Sutter							1,291	67 00	86,620 00
Tehama							4,880	30 00	145,590 00
Trinity	1	75 00	75 00	1,073	24 25	26,028 00	123	69 02	8,500 00
Tulare	15	368 00	5,525 00				886	49 00	43,420 00
Tuolumne							46		
Ventura	5		1,425 00	1,989		60,702 00	580		32,563 00
Yolo				3,151	45 00	142,220 00	1,973	90 00	166,625 00
Yuba	9	350 00	3,150 00				1,310	54 60	71,525 00
Totals	536	$247 32	$148,648 00	58,478	$31 09	$1,818,357 00	83,312	$56 84	$4,733,150 00

NOTE.—The Assessors of Butte, Monterey, and Shasta are the only ones who seem to know what "graded" means, being a term used by stock raisers to indicate the produce of a thoroughbred sire and a dam of inferior blood.

Schedule T.—Continued.

Counties.	Horses—Spanish.			Colts.			Cattle—Beef.		
	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.
Alameda	1,925	$36 49	$70,250 00	1,545	$13 45	$20,785 00	282	$26 17	$7,380 00
Alpine				54	19 00	1,065 00	20	12 00	240 00
Amador									
Butte	900	20 00	18,000 00	1,015	20 00	20,300 00	200	25 00	5,000 00
Calaveras	1,000	15 00	15,000 00	427	16 79	7,169 00			
Colusa	4,874	41 17	200,671 00	1,425	20 15	28,720 00	407	20 13	8,155 00
Contra Costa	520	14 25	7,410 00	1,125	20 00	22,500 00	200	25 00	5,500 00
Del Norte	211	32 66	7,120 00	100	20 40	2,040 00	5	15 00	75 00
El Dorado	1,638	31 55	51,655 00	524	18 73	9,820 00			
Fresno	1,569		29,215 00	821		9,936 00	138	15 69	2,166 00
Humboldt				984	8 00	7,872 00	242	14 93	3,613 00
Inyo	2,636	26 17	55,814 00	326	11 49	3,748 00	117	19 20	2,248 00
Kern	368	15 00	5,520 00	786	10 50	8,253 00	1,388	20 00	27,760 00
Lake				380	19 88	7,557 00	40	14 62½	585 00
Lassen				1,011		9,099 00	682	20 00	13,640 00
Los Angeles	5,410	19 44	105,171 00	1,330	12 30	16,364 00	269	15 14	4,073 00
Marin				422	29 54	12,470 00	222	15 42	3,425 00
Mariposa				221	12 09	2,673 00	136	19 52	2,655 00
Mendocino	2,843		68,267 00	615		10,404 00	352		5,401 00
Merced	2,670	37 50	88,760 00	450	18 00	8,064 00	128	13 00	2,270 00
Modoc				854	18 53	15,826 00			
Mono							300	20 00	6,000 00
Monterey	5,267	30 00	158,025 00	1,265	8 00	10,135 00			
Napa				778	21 80	16,967 00	105	20 00	2,100 00
Nevada	1,474	42 40	62,500 00	560	18 00	10,085 00	59	21 53	1,270 00
Placer	1,608	30 26	48,670 00	471	21 52	10,137 00	483		7,983 00
Plumas	450	15 00	6,750 00	339	18 00	6,100 00	500	20 00	10,000 00
Sacramento	4,372	34 82	152,230 00	3,094	40 62	125,685 00	219	33 17	7,265 00
San Benito	760	15 00	11,400 00	600	18 00	10,400 00			
San Bernardino				825	18 00	14,850 00			
San Diego	3,169		49,132 00	378		3,113 00	77		1,206 00
San Francisco									
San Joaquin	7,474	33.33	249,148 00	2,368	22 44	53,144 00	92	15 38	1,415 00
San Luis Obispo				1,279	12 74	16,287 00	912	16 10	14,688 00

San Mateo				828	20 00	16,610 00	1,659	12 00	19,965 00
Santa Barbara	3,076	22 53	69,306 00	681	12 86	8,761 00	926	16 37	15,156 00
Santa Clara	4,763	30 00	142,890 00	1,636	18 00	29,448 00	575	20 00	11,500 00
Santa Cruz	1,166	14 91	17,490 00	434	10 00	4,340 00	56	25 00	1,400 00
Shasta	3,184	24 14	76,874 00	1,088	12 63	13,744 00	35	16 00	560 00
Sierra				313	31 86	3,714 00	231	17 83	4,120 00
Siskiyou	3,600	15 00	54,000 00	800	10 00	8,000 00			
Solano				1,096	19 91	21,904 00	163	27 68	3,512 00
Sonoma	1,645	20 00	32,720 00	1,733	20 00	35,720 00	413	15 00	6,001 00
Stanislaus				992	21 00	20,774 00			
Sutter	3,111	35 00	109,910 00	761	20 00	15,764 00			
Tehama				552					
Trinity				131	13 25	1,741 00	37	16 62	615 90
Tulare	4,860	27 00	130,035 00	1,385	12 00	17,078 00	694	18 00	12,830 00
Tuolumne	3,054								
Ventura				438		11,362 00			
Yolo	932	26 00	24,620 00	1,725	28 00	49,242 00	447	29 00	13,179 00
Yuba	2,344	27 50	64,415 00	690	18 34	12,660 00	155	27 19	4,215 00
Totals	82,873	$27 35	$2,182,968 00	41,655	$18 80	$772,430 00	12,966	$18 45	$239,166 00

Schedule T.—Continued.

Counties.	Cattle—Stock.			Cows—Thoroughbred.			Cows—American.		
	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.
Alameda	3,694	$8 68	$32,097 00	34	$95 58	$3,250 00	3,991	$20 54	$81,984 00
Alpine	392	10 00	4,037 00				239	25 00	5,950 00
Amador									
Butte	4,850	12 00	58,200 00	50	52 00	2,600 00	2,950	23 00	67,850 00
Calaveras	2,024	15 00	30,360 00				2,498	25 00	62,450 00
Colusa	2,371	12 55	29,776 00	2	80 00	160 00	2,268	23 79	53,960 00
Contra Costa	4,200	10 00	42,000 00	25	40 00	1,000 00	4,050	19 00	76,950 00
Del Norte	770	10 33	7,961 00						
El Dorado	6,003	10 20	61,230 00						
Fresno	28,095		280,999 00				248		6,023 00
Humboldt	14,742	8 98	132,524 00						
Inyo	5,219	9 71	50,825 00	3	123 33	370 00			
Kern	24,456	10 00	244,560 00	40	40 00	1,600 00	284	25 00	7,100 00
Lake	1,425	12 08½	17,231 00	1	200 00	200 00			
Lassen	13,408		134,080 00	10	40 00	400 00			
Los Angeles	6,323	9 49	59,990 00	20	48 75	975 00	1,130	25 16	28,430 00
Marin	3,211	12 42	39,891 00	92	37 66$\frac{9}{10}$	3,465 00	23,677	18 00	426,423 00
Mariposa	3,692	12 00	44,304 00						
Mendocino	6,110		58,358 00				3,499		64,843 00
Merced	7,872	12 25	80,435 00				1,145	23 60	26,915 00
Modoc	18,764	10 00	187,640 00				595	15 00	8,735 00
Mono	8,000	10 00	80,000 00				900	20 00	18,000 00
Monterey	12,353	10 00	123,530 00	12	100 00	1,200 00	2,745	16 00	43,934 00
Napa	3,100	11 93	37,780 00	28	47 67	1,335 00	3,972	20 13	79,968 00
Nevada	2,856	11 64	33,250 00	12	100 00	1,200 00			
Placer	2,202		24,244 00						
Plumas	2,200	10 00	22,000 00				3,500	20 00	70,000 00
Sacramento	9,683	12 99	125,485 00	39	99 40	3,875 00	10,021	20 19	200,420 00
San Benito	7,490	8 50	63,665 00				2,685	19 00	51,015 00
San Bernardino	4,466	8 00	35,728 00	11	50 00	550 00	67	30 00	2,010 00
San Diego	8,106		62,860 00	40		1,255 00			
San Francisco	5,450		127,209 00						
San Joaquin	6,501	8 25	53,648 00				4,475	22 96	102,748 00

San Luis Obispo	13,243	9 73	128,639 00						
San Mateo				64	79 00	5,060 00			
Santa Barbara	9,818	11 35	111,391 00				14	57 14	800 00
Santa Clara	7,153	12 00	85,836 00	76	50 00	3,800 00	7,431	20 00	148,620 00
Santa Cruz	791	7 00	5,528 00				1,014	20 00	20,280 00
Shasta	7,540	10 00	75,440 00				1,415	19 90	28,165 00
Sierra	909	9 91	9,009 00						
Siskiyou	18,000	10 00	180,000 00						
Solano	4,723	10 00	47,452 00				3,005	19 20	57,618 00
Sonoma	3,718	10 00	35.998 00	31	60 00	1,850 00	14.520	20 00	280,400 00
Stanislaus	4,258	12 00	51,863 00						
Sutter	1,920	10 50	20,192 00				635	20 33	12,822 00
Tehama	5,890	10 42	59.230 00	25	30 00	750 00	1,910	10 00	19,100 00
Trinity	3,704	11 32	41,954 00	5	28 00	140 00			
Tulare	5,572	10 00	55,797 00						
Tuolumne									
Ventura	1,067		12,327 00	4	100 00	400 00			
Yolo	2,452	13 00	30,412 00				3,980	22 00	87,801 00
Yuba	3,236	10 00	32,360 00	4	62 50	250 00	2,983	16 77	50,045 00
Totals	324,022	$10 39	3,369,325 00	628	$56 82	$35,685 00	111,846	$19 59	$2,191,359 00

SCHEDULE T.—Continued.

COUNTIES.	COWS—GRADED.			CALVES.			OXEN.		
	Number.	Average Value	Total Value.	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.
Alameda	1,042	$22 45	$23,943 00	1,313	$4 72	$6,200 00			
Alpine				287	5 00	1,435 00	17	$40 00	$680 00
Amador									
Butte	1,400	21 00	30,000 00	2,450	6 00	14,700 00	300	30 00	9,000 00
Calaveras				1,940	8 00	15,520 00	29	47 50	1,377 00
Colusa				559	10 31	5,765 00	8	62 50	500 00
Contra Costa				2,500	4 50	11,250 00			
Del Norte	2,311	19 31	44,646 00	525	5 21	2,737 00	77	33 37	2,570 00
El Dorado	3,958	19 14	75,765 00	2,210	5 00	11,050 00	123	37 96	4,670 00
Fresno	1,568		27,763 00	1,125	5 47	6,164 00	34		1,470 00
Humboldt	7,789	15 87	123,653 00	4,092	3 28	13,437 00	233	31 67	8,380 00
Inyo	1,082	18 39	19,901 00	406	6 20	2,520 00	187	40 33	7,542 00
Kern	1,118	15 25	16,049 00	2,954	2 71	8,005 00	45	25 00	1,125 00
Lake	1,529	22 01	33,650 00	1,182	5 88	6,951 00	58	17 00	986 00
Lassen	1,235	17 00	20,995 00	4,772	5 00	23,860 00			2,040 00
Los Angeles	4,202	19 29	81,083 00	1,966	5 36	10,531 00	9	25 55	230 00
Marin				2,595	5 08	13,200 00	80	39 31	3,145 00
Mariposa	1,049	15 00	15,735 00	998	5 00	4,990 00	57	37 50	2,137 00
Mendocino				1,983	5 03	7,457 00	369		15,210 00
Merced	40	40 00	1,600 00	1,792	3 33	5,945 00			
Modoc				1,128	5 06	5,701 00	238	27 53	6,547 00
Mono							400	40 00	16,000 00
Monterey	2,237	12 00	26,750 00	1,264	4 00	4,990 00			
Napa				2,298	5 15	11,838 00	6	20 00	120 00
Nevada	1,868	32 97	61,590 00	1,346	4 49	6,040 00	177	37 34	6,610 00
Placer	2,652	21 05	55,835 00	1,277	6 84	8,745 00	290	36 39	10,565 00
Plumas				1,900	4 00	7,600 00	200	45 00	9,000 00
Sacramento				4,760	5 29	25,205 00	33	18 73	620 00
San Benito									
San Bernardino	2,519	16 00	40,304 00	847	4 00	3,388 00	80	8 00	640 00
San Diego				843	4 16	3,513 00	43		850 00
San Francisco									
San Joaquin	76	41 51	3,155 00	2,100	6 32	13,289 00			

San Luis Obispo	11,459	19 18	219,881 00	7,114	4 68	33,316 00			
San Mateo	5,355	20 00	104,985 00	1,956	6 66	13,045 00	20	30 00	600 00
Santa Barbara	2,998	22 55	67,620 00	2,085	3 57	7,440 00	17	30 59	520 00
Santa Clara				3,175	5 00	15,875 00	125	20 00	2,500 00
Santa Cruz	2,087	15 00	31,305 00	869	5 00	4,345 00	272	18 00	4,896 00
Shasta	4	75 00	300 00	1,093	5 12	5,600 00	121	27 27	3,300 00
Sierra	1,081	20 66	22,339 00	492	4 57	2,253 00	163	34 70	5,655 00
Siskiyou	3,400	20 00	68,000 00	7,500	5 00	37,500 00	100	25 00	2,500 00
Solano									
Sonoma	4,200	15 00	61,630 00	4,309	5 00	21,553 00	120	20 00	2,300 00
Stanislaus	1,897	25 00	47,425 00	1,378	5 00	6,890 00	43	30 00	1,290 00
Sutter	1,192	17 50	20,806 00	464	4 62	2,145 00			
Tehama				1,840			100	50 00	5,000 00
Trinity	476	21 28	10,153 00	470	4 94	2,323 00	78	43 65	3,405 00
Tulare				2,329	5 00	11,128 00	53	25 00	1,300 00
Tuolumne				2,250					
Ventura	1,114		24,701 00	335	7 83	2,624 00			
Yolo				1,642	8 00	13,442 00	2	50 00	100 00
Yuba				2,029	5 00	10,145 00	112	30 98	3,460 00
Totals	72,938	$18 94	$1,381,562 00	96,055	$4 91	$451,650 00	4,419	$30 95	$148,840 00

SCHEDULE T.—Continued.

COUNTIES.	MULES.			JACKS AND JENNIES.			GOATS—COMMON.		
	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.
Alameda	480	$49 44	$23,735 00	4	$100 00	$400 00	160	$1 62	$260 00
Alpine									
Amador									
Butte	1,760	50 00	88,000 00	9	100 00	900 00	2,000	1 50	3,000 00
Calaveras	60	44 00	2,645 00	35	8 00	284 00	9,576	75	7,182 00
Colusa	3,234	66 19	214,086 00	54	123 33	6,660 00	392	1 24	488 00
Contra Costa	441	51 75	22,821 00				212	1 00	212 00
Del Norte	135	36 00	4,875 00				137	2 89	402 00
El Dorado	89	45 00	4,010 00	27	15 00	405 00	10,152	1 05	10,660 00
Fresno	480		21,604 00	76		2,110 00	4,606		3,170 00
Humboldt	995	32 70	32,527 00	8	55 00	439 00	318	1 78	566 00
Inyo	421	42 26	17,794 00	13	19 23	250 00	650	1 00	650 00
Kern	667	43 10	28,748 00	136	12 00	1,904 00	594	1 10	653 00
Lake	182	47 60	8,605 00	5	164 00	820 00	3,849	1 31	5,049 00
Lassen	204	20 00	4,080 00	2	200 00	400 00	2,000		4,000 00
Los Angeles	770	36 56	28,152 00	22	27 69	609 00	226	1 01	229 00
Marin	69	39 85	2,750 00				250	1 00	250 00
Mariposa	256	37 09	9,495 00	87		1,250 00	12,121	95	11,593 00
Mendocino	395		13,941 00	10		605 00			
Merced	867	64 00	55,165 00	8	190 00	1,550 00	713	1 00	713 00
Modoc	253	39 54	10,004 00	15	254 00	3,815 00			
Mono	200	40 00	8,000 00	54	20 00	1,080 00	100	1 00	100 00
Monterey	1,345	50 00	67,250 00				1,270		1,270 00
Napa	492	58 99	29,025 00	11	45 45	500 00	1,459	1 08	1,584 00
Nevada	119	52 52	6,255 00				3,274	1 25	4,080 00
Placer	232	64 33	14,925 00	16	80 62	1,290 00	7,699	1 00	7,719 00
Plumas	100	50 00	5,000 00	20	25 00	500 00	450	1 00	450 00
Sacramento	380	61 45	23,350 00	15	42 33	635 00	161		185 00
San Benito	40	38 00	1,520 00				1,300	1 00	1,300 00
San Bernardino	232	35 00	8,120 00	5	5 00	25 00	412	1 00	412 00
San Diego	284		4,970 00	6		115 00	1,988		1,443 00
San Francisco	85		4,373 00				137	4 00	573 00
San Joaquin	1,390	58 85	81,815 00	62	138 70	8,590 00	442	88	392 00

San Luis Obispo	182	36 75	6,871 00	4	21 75	87 00	452	1 00	503 00
San Mateo	196	39 00	7,685 00				30	1 00	35 00
Santa Barbara	324	30 20	9,785 00	4	162 50	650 00	400	2 00	800 00
Santa Clara	148	50 00	7,400 00	6	40 00	240 00	1,275	1 00	1,275 00
Santa Cruz	74	39 20	2,900 00	11	60 00	660 00	56	1 00	56 00
Shasta	212	44 00	9,325 00	16	98 43	1,575 00	6,157	1 45	8,948 00
Sierra	72	50 13	3,610 00	8	8 87	71 00	400	1 50	600 00
Siskiyou	700	40 00	28,000 00	20	200 00	4,000 00	700	2 00	1,400 00
Solano	599	55 14	33,030 00				81	2 14	174 00
Sonoma	460	50 00	22,150 00	13	20 00	215 00	1,100	1 00	1,100 00
Stanislaus	1,774	64 00	113,536 00	59	115 00	6,805 00	765	1 50	1,148 00
Sutter	786	67 00	52,609 00	4	278 75	1,115 00	25	2 60	65 00
Tehama	1,041	50 00	52,126 00	4	100 00	400 00	500	2 00	1,000 00
Trinity	332	36 92	12,259 00	11	100 90	1,110 00	307	12 41	412 00
Tulare	559	35 00	19,779 00	67	12 00	823 00	2,785	1 00	2,961 00
Tuolumne	195			10			1,950		
Ventura	213		7,305 00				252		280 00
Yolo			88,419 00						
Yuba	340	46 66	15,865 00	10	43 50	435 00	2,619	1 00	2,619 00
Totals	24,864	$50 74	$1,340,294 00	947	$56 90	$53,322 00	86,502	$1 08	$91,961 00

Schedule T.—Continued.

Counties.	Goats—Angora.			Hogs.			Sheep—Imported or Fine.		
	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.
Alameda				3,948	$2 54	$10,129 00	1,500	$8 33	$12,500 00
Alpine				130	4 00	616 00			
Amador									
Butte	700	$2 00	$1,400 00	101,500	3 00	304,500 00	450	10 00	4,500 00
Calaveras	83		395 00	2,263		6,415 00			
Colusa	96	5 18	498 00	13,104	3 31	43,396 00	915		3,298 00
Contra Costa	15	5 00	75 00	6,230	2 00	12,460 00			
Del Norte				912	2 47	2,258 00			
El Dorado	1,520	5 20	7,905 00	2,730	4 89	13,355 00			
Fresno				21,767		34,491 00			
Humboldt	55	3 15	170 00	7,267	1 64	11,959 00	351	6 65	2,337 00
Inyo				1,534	3 42	5,208 00			
Kern				14,928	2 00	29,856 00	628	4 80	3,014 00
Lake	9	42 88	386 00	4,539	1 68½	7,626 00	16	2 50	40 00
Lassen				1,330		2,660 00			
Los Angeles				18,990	1 31	24,981 00	841	5 47	4,602 00
Marin				6,349	1 92	12,247 00			
Mariposa	47	25 00	1,175 00	9,001	2 08	18,731 00	6	5 00	30 00
Mendocino	1,830		3,571 00	9,064		15,814 00			
Merced				7,273	2 25	16,382 00			
Modoc				3,090	1 83	5,661 00			
Mono				700	5 00	3,500 00			
Monterey				12,150		15,225 00			
Napa	3	3 33	10 00	6,996	1 90	13,294 00			
Nevada				2,326	3 50	8,140 00			
Placer	2,055	2 22	4,567 00	3,355	3 72	12,489 00			
Plumas				1,000	5 00	5,000 00			
Sacramento	170		1,880 00	14,949	2 94	44,090 00			
San Benito	600	2 00	1,260 00	5,220	1 25	6,525 00			
San Bernardino	300	1 50	450 00	2,671	1 25	3,338 00			
San Diego				3,822	1 00	3,822 00	511		1,230 00
San Francisco				1,868		8,303 00			
San Joaquin				13,500	2 15	29,368 00	869	4 62	4,015 00
San Luis Obispo				12,691	1 59	20,201 00			

San Mateo	900	1 50	1,350 00	3,416	2 34	7,995 00			
Santa Barbara				10,021	1 30	12,987 00			
Santa Clara				9,729	2 50	24,322 00	245	10 00	2,450 00
Santa Cruz				2,215	5 00	11,075 00			
Shasta	9	7 33	66 00	10,954	1 92	21,082 00			
Sierra				317	5 00	1,579 00			
Siskiyou				1,600	2 00	3,200 00			
Solano				6,565	2 02	13,307 00			
Sonoma	950	20 00	1,900 00	18,120	2 12	38,540 00	43	10 00	435 00
Stanislaus				9,816		14,510 00			
Sutter				12,676	1 50	19,116 00			
Tehama				7,590	2 47	18,856 00			
Trinity				888	3 06	2,721 00			
Tulare	5	40 00	200 00	22,506	2 00	45,012 00			
Tuolumne				2,500					
Ventura				19,453		32,272 00			
Yolo				17,177	1 75	31,327 00			
Yuba				4,694	2 50	11,745 00			
Totals	9,347	$2 91	$27,258 00	477,434	$2 20	$1,050,686 00	6,375	$6 03	$38,451 00

SCHEDULE T.—Continued.

COUNTIES.	SHEEP—GRADED.			SHEEP—COMMON.			LAMBS.		
	Number	Average Value.	Total Value.	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.
Alameda	5,428		$7,545 00	14,200	$1 08	$15,450 00	9,120	$0 50	$4,620 00
Alpine	878	$2 00	1,756 00	878	2 00	1,756 00			
Amador									
Butte	7,500	2 00	15,000 00	88,050	1 50	132,075 00			
Calaveras				57,001	1 50	85,501 00	14,330	25	3,582 00
Colusa				146,307	1 53	225,260 00	12,765	43	5,556 00
Contra Costa				15,070	1 25	18,837 00			
Del Norte				1,404	1 90	2,679 00			
El Dorado	22,999	50	34,500 00						
Fresno	1,444		2,973 00	416,916		624,846 00	127,447		34,371 00
Humboldt	2,910	1 71	13,601 00	161,363	1 58	255,212 00	1,205	55	656 00
Inyo				7,773	1 71	13,335 00	16	50	8 00
Kern				286,785	1 47	424,600 00	73,720	50	36,860 00
Lake	3,036	1 46	4,452 00	42,651	1 00	42,651 00			
Lassen				25,864		25,864 00			
Los Angeles	388,270	1 50	584,533 00				13,308	50	6,661 00
Marin				1,036	1 25	1,295 00	133	1 00	133 00
Mariposa	2,641	2 00	5,282 00	61,463	1 25	76,828 00	18,101	50	9,201 00
Mendocino	2,132		7,467 00	244,516		482,279 00	32,699		16,396 00
Merced	3,877	2 00	7,536 00	228,593	1 25	287,173 00	72,728	50	36,421 00
Modoc				36,833	1 25	46,041 00			
Mono				500	1 00	500 00			
Monterey	4,690		12,950 00	100,399		100,399 00	22,850		11,925 00
Napa	70	2 67	187 00	45,998	1 48	68,374 00	11,748	45	5,384 00
Nevada				3,306	1 43	4,735 00	570	50	285 00
Placer	80	7 81	625 00	60,698		89,839 00	13,170		6,802 00
Plumas				10,000	1 25	12,500 00	1,000	1 00	1,000 00
Sacramento	27,592	1 72	47,370 00	111,959	1 35	150,585 00	31,142	51	15,915 00
San Benito	7,842	1 12½	8,822 00	53,116	1 25	63,395 00	2,500	50	1,250 00
San Bernardino				42,751	1 00	42,751 00			
San Diego				141,713		176,702 00			
San Francisco	416		890 00						
San Joaquin				99,877	1 41	141,154 00	26,742	50	13,593 00
San Luis Obispo	80,458	1 94	156,124 00	53,634	1 55	83,072 00	26,904	50	13,933 00

San Mateo				536	1 36	670 00			
Santa Barbara	14,420	2 08	29,984 00	154,832	1 58	242,953 00	34,087	25	8,624 00
Santa Clara				23,475	1 00	23,475 00	690	50	345 00
Santa Cruz	415	2 00	830 00	833	1 00	833 00	69	50	35 00
Shasta				42,542	1 24	53,135 00	1,038	44	455 00
Sierra	555	1 01	561 00						
Siskiyou				33,000	2 00	66,000 00			
Solano				58,804	1 12	67,643 00			
Sonoma	2,100	2 00	4,320 00	123,712	1 00	127,514 00	35,280	50	17,640 00
Stanislaus	5,284	4 00	21,136 00	129,815	1 30	171,006 00	46,638	50	24,596 00
Sutter				33,698	1 46	49,265 00			
Tehama				218,000	1 00	218,000 00	5,332	25	1,333 00
Trinity				30,139	1 40	44,435 00			
Tulare	2,277	3 00	8,057 00	233,905	1 50	325,781 00			
Tuolumne				9,660					
Ventura	628		2,326 00	124,099		221,127 00			
Yolo	65,936	1 50	98,349 00						
Yuba	49,398	1 50	74,097 00						
Totals	703,276	$1 77	$1,251,273 00	3,777,705	$1 40	$5,307,525 00	635,632	$0 50	$319,160

SCHEDULE T.—Continued.

COUNTIES.	POULTRY.			BRANDIES.			WINES.		
	No. Doz.	Average Value.	Total Value.	No. Gallons.	Average Value.	Total Value.	No. Gallons.	Average Value.	Total Value.
Alameda	4,754	$3 12	$14,860 00	106,800	$0 25	$26,700 00			$6,500 00
Alpine	92	6 00	555 00						
Amador									
Butte	1,120	6 00	6,700 00	1,400	2 00	2,800 00	7,000	$0 20	1,400 00
Calaveras	1,530	4 00	6,120 00	4,324	1 54	6,668 00	18,170	20	3,959 00
Colusa	2,636	3 02	7,964 00			9,060 00			
Contra Costa	2,420	4 00	9,680 00				4,000	20	800 00
Del Norte	234	3 43	808 00	1,070	3 10	3,320 00	100	1 00	100 00
El Dorado	1,134	5 00	5,670 00	3,547	1 25	4,435 00	68,420	12	8,295 00
Fresno	1,939		6,228 00			3,331 00	25,000		6,250 00
Humboldt	1,729	2 24	3,871 00				558	1 34	749 00
Inyo	453	6 10	2,773 00						
Kern	976	2 50	2,440 00						
Lake	1,437	3 24	4,662 00	416	2 00	832 00	80	25	20 00
Lassen	360	3 00	1,080 00						
Los Angeles			17,028 00	3,535	95	3,355 00	95,290	15	14,349 00
Marin	653	3 86	2,521 00			2,407 00			
Mariposa	539	2 50	1,348 00	405	1 18	483 00	3,000	25	750 00
Mendocino			6,321 00						
Merced	899	3 00	3,062 00	3,700	1 70	6,200 00	2,600	25	592 00
Modoc	660	3 00	1,993 00						
Mono	100	5 00	500 00	3,485	3 00	10,455 00			
Monterey	6,484	2 50	16,210 00						
Napa	2,380	5 00	11,900 00	25,720	63	16,231 00	776,557	15	117,957 00
Nevada	990	5 00	4,950 00			9,200 00	35,000	26	925 00
Placer	1,077	8 81	9,498 00	1,343	2 13	2,906 00	26,640		9,379 00
Plumas	700	5 00	3,500 00	2,000	2 00	4,000 00	1,000	1 50	1,500 00
Sacramento	5,913	5 00	29,565 00	17,553	1 92	33,700 00	27,810	23	6,455 00
San Benito	600	2 00	1,200 00	1,200	2 00	2,400 00	25,000		2,500 00
San Bernardino	814	1 50	1,221 00				10,000	40	4,000 00
San Diego	680		2,040 00	350	1 61	551 00	940		201 00
San Francisco			11,612 00			661,093 00			
San Joaquin	5,442	4 50	24,493 00	15,814	62	9,912 00	21,876	39	8,532 00

San Luis Obispo	1,860	2 17	4,041 00	1,179	1 87	2,205 00			
San Mateo	833	3 50	3,090 00			3,845 00	315		
Santa Barbara	1,731	2 16	3,744 00				100	25	25 00
Santa Clara	6,520	4 00	26,080 00	51,750	1 00	51,750 00	136,820	15	20,523 00
Santa Cruz	2,000	3 00	6,000 00				1,000	26	2,600 00
Shasta	946	3 87	3,668 00	450	2 13	960 00	3,100	29	920 00
Sierra									
Siskiyou	700	4 00	2,800 00	2,000	2 00	2,000 00			
Solano	1,322	3 50	4,625 00						
Sonoma	4,358	4 50	21,120 00	7,133	80	6,950 00	659,000	15	118,500 00
Stanislaus	2,820	3 00	8,460 00	11,950	90	10,755 00			
Sutter	2,241	3 00	6,823 00	521	3 20	1,745 00	306	2 00	639 00
Tehama	100	6 00	600 00				300	25	75 00
Trinity	361	6 00	2,167 00	616	2 23	1,388 00	616	2 25	1,388 00
Tulare	1,283	3 00	3,849 00	317	3 00	1,029 00	2,200	25	550 00
Tuolumne							90,400		
Ventura	1,320		3,794 00	635	5 24	3,330 00	3,000		600 00
Yolo	2,969	3 00	9,478 00	2,776	25	1,385 00	2,766	25	1,383 00
Yuba	416	4 00	1,664 00	4,224	2 35	9,926 00	21,000	35	7,350 00
Totals	80,525	$3 71	$334,377 00	276,213	$0 82	$917,307 00	2,069,964	$0 17	$349,766 00

Schedule T.—Continued.

Counties.	Beehives.			Honey.			Broomcorn.		
	Number.	Average Value.	Total Value.	No. Pounds.	Average Value.	Total Value.	No. Pounds.	Average Value.	Total Value.
Alameda									
Alpine			$148 00						
Amador									
Butte	250	$1 00	250 00						
Calaveras	291	1 00	291 00						
Colusa	377	1 22	462 00						
Contra Costa									
Del Norte	14	2 78	39 00						
El Dorado	216	1 25	270 00						
Fresno									
Humboldt	258	1 00	258 00	75	$0 12	$9 00			
Inyo	362	7 11	2,603 00				3,000		$10 00
Kern	477	2 25	1,060 00						
Lake	239	2 64	631 00				4,000	12	50 00
Lassen	40	2 00	80 00						
Los Angeles	12,179	1 99	24,229 00	2,480	06	161 00			
Marin									
Mariposa	7	1 50	11 00						
Mendocino									
Merced	337	2 10	710 00						
Modoc	7	4 00	30 00						
Mono	60	5 00	300 00						
Monterey	2,943	1 00	2,943 00						
Napa	212	1 28	273 00				1,000	2	20 00
Nevada	115	1 74	200 00						
Placer	224	1 77	408 00						
Plumas	275	2 00	550 00	3,000	15	450 00			
Sacramento	315	2 16	680 00						
San Benito	30	2 00	60 00						
San Bernardino	3,133	1 00	3,133 00	6,000	05	300 00			
San Diego	25,470	79	20,350 00	17,840	05	892 00			
San Francisco									
San Joaquin	685	1 05	723 00						
San Luis Obispo	877	95	837 00						

San Mateo	175	1 00	175 00							
Santa Barbara	2,213	1 00	2,213 00							
Santa Clara	190	1 00	190 00							
Santa Cruz										
Shasta	288	1 00	290 50							
Sierra	30	1 50	50 00							
Siskiyou	1,000	3 00	3,000 00							
Solano										
Sonoma	214	1 04	224 00							
Stanislaus	339	1 50	508 00							
Sutter	288	1 00	288 00							
Tehama										
Trinity	43	2 18	94 00							
Tulare	1,416	2 00	2,864 00							
Tuolumne	310			1,600	06	96 00				
Ventura	3,616	2 79	10,097 00							
Yolo	395	2 00	795 00							
Yuba	15	1 00	15 00				14,000		5	720 00
Totals	59,925	$1 21	$72,332 00	30,995	$0 06	$1,908 00	22,000		$0 04½	$800 00

SCHEDULE T.—Continued.

COUNTIES.	BUTTER.			CHEESE.			FLAX.		
	No. Pounds.	Average Value.	Total Value.	No. Pounds.	Average Value.	Total Value.	No. Pounds.	Average Value.	Total Value.
Alameda									
Alpine									
Amador									
Butte									
Calaveras	1,050	$0 20	$220 00	330	$0 13	$45 00			
Colusa									
Contra Costa	1,000	20	200 00	3,000	10	300 00			
Del Norte									
El Dorado									
Fresno									
Humboldt	21,037	13¼	3,181 00	1,400	10	140 00			
Inyo									
Kern									
Lake	10	20	2 00						
Lassen									
Los Angeles	1,000	05	50 00	3,400	05	170 00			
Marin				5,500	90$\frac{9}{10}$	500 00			
Mariposa	100	25	25 00						
Mendocino									
Merced									
Modoc									
Mono									
Monterey									
Napa									$19,212 00
Nevada									
Placer									
Plumas	5,000	20	1,000 00	6,000	15	900 00			
Sacramento									
San Benito									
San Bernardino									
San Diego									
San Francisco									
San Joaquin	575	17	103 00						
San Luis Obispo	1,300	09	147 00	20,310	09½	1,951 00			

San Mateo									
Santa Barbara									
Santa Clara				88,795	06	5,327 00			
Santa Cruz	38,961	20	7,792 00	11,734	15	1,760 00			
Shasta									
Sierra									
Siskiyou									
Solano									
Sonoma	4,100	08	366 00	4,000	05	223 00			
Stanislaus									
Sutter									
Tehama									
Trinity									
Tulare									
Tuolumne	21,000								
Ventura									
Yolo									
Yuba	1,000	20	200 00						
Totals	99,133	$0 17	$13,286 00	144,469	$0 08	$11,316 00			$19,212 00

Schedule T.—Continued.

Counties.	Grain.			Hay.			Hops.		
	No. Tons.	Average Value.	Total Value.	No. Tons.	Average Value.	Total Value.	No. Pounds.	Average Value.	Total Value.
Alameda	7,855	$17 56	$138,005 00	8,675	$5 65	$49,055 00			
Alpine				166	13 00	2,195 00			
Amador									
Butte	1,500	20 00	30,000 00	1,700		10,200 00			
Calaveras	131	20 00	2,610 00	357	8 62	3,083 00	50	$0 24	$12 00
Colusa	5,370	18 09	97,141 00	1,121	6 02	6,757 00			
Contra Costa	720	27 00	19,440 00	2,500	5 50	13,750 00			
Del Norte	41	28 65	1,175 00	140	9 35	1,265 00			
El Dorado	23	25 87	595 00	61	16 31	995 00			
Fresno			17,498 00						
Humboldt	736	11 94	8,792 00	191	6 21	1,186 00			
Inyo	285	52 84	15,060 00	933	6 53	6,099 00			
Kern	602	18 00	10,836 00	1,131	3 00	3,393 00			
Lake	592	17 37½	10,287 00	374	8 62½	3,226 00	2,400	30	720 00
Lassen	250		5,000 00	1,000		4,500 00			
Los Angeles	4,248	10 40	44,146 00	206	3 34	689 00	300	33⅓	100 00
Marin	153	22 00	3,366 00	48	6 25	300 00			
Mariposa	109	21 49	2,343 00	209	12 42	2,396 00			
Mendocino	530		10,747 00	800		4,834 00			
Merced	2,750		71,313 00	424	4 40	1,897 00			
Modoc	105	25 00	2,624 00						
Mono	100	70 00	7,000 00	300	25 00	7,600 00			
Monterey	1,645	13 00	21,480 00						
Napa	448	26 56	11,899 00	583	5 02	2,927 00	7,100	29	2,125 00
Nevada									
Placer	337	27 64	9,316 00	108	8 80	951 00			
Plumas	450	30 00	13,500 00	2,500	8 00	20,000 00			
Sacramento	4,863	8 75	42,580 00	2,923	4 99	14,595 00			2,800 00
San Benito			28,985 00						
San Bernardino				3,610	3 00	10,890 00			
San Diego	56		610 00	228		807 00			
San Francisco			56,222 00			9,137 00			6,700 00
San Joaquin	15,391	28 51	438,848 00	2,150	6 20	13,338 00			

San Luis Obispo	485	12 37	5,991 00	612	2 23	1,379 00			
San Mateo	1,182	14 00	16,765 00	593	4 25	2,510 00			
Santa Barbara	1,051	10 06	10,578 00						
Santa Clara	3,875	23 25	90,250 00	6,436	5 00	32,180 00			
Santa Cruz	1,140	5 32	6,070 00	50	5 00	250 00			
Shasta	433	24 20	10,480 00	408	11 44	4,670 00			
Sierra	32	30 00	960 00	463	6 00	2,778 00			
Siskiyou	600	20 00	12,000 00						
Solano									
Sonoma	1,500	20 00	27,000 00	3,115	5 00	15,575 00			
Stanislaus	1,163	25 00	29,075 00	588	6 00	3,528 00			
Sutter	1,843	18 50	34,221 00						
Tehama									
Trinity			1,558 00	70	20 00	1,680 00			
Tulare	190	22 00	4,151 00	31	5 00	152 00			
Tuolumne				21,000					
Ventura	1,935		24,244 00	59		408 00			
Yolo	5,500	22 00	121,151 00	2,000	3 50	7,045 00			
Yuba	1,273	24 94	31,760 00	182	10 00	1,820 00			
Totals	71,492	$20 90	$1.547,672 00	68,045	$5 50	$270,040 00	9,850	$0 30	$12,457 00

SAN FRANCISCO
PUBLIC LIBRARY

SCHEDULE T.—Continued.

COUNTIES.	TOBACCO.			WOOL.			WOOD.		
	No Pounds	Average Value.	Total Value.	No. Pounds	Average Value.	Total Value.	No. Cords.	Average Value.	Total Value.
Alameda			$2,000 00			$6,771 00	960		$11,930 00
Alpine							8,341		23,291 00
Amador									
Butte				5,700	$0 20	1,150 00	1,200	$1 00	1,200 00
Calaveras			2,322 00				115		193 00
Colusa							2,559		7,677 00
Contra Costa							215	4 00	860 00
Del Norte				100	20	20 00	133	2 14	285 00
El Dorado							4,840	1 92	9,290 00
Fresno									
Humboldt				4,150	30	1,246 00	1,420	2 50	3,551 00
Inyo							292	1 75	543 00
Kern							150	2 50	375 00
Lake							5,075	1 70	8,628 00
Lassen							750		750 00
Los Angeles							40	2 47	99 00
Marin							925	1 44	1,337 00
Mariposa				5,600	20	1,120 00	3,128	2 54	7,962 00
Mendocino							1,509		3,075 00
Merced							770	2 50	1,955 00
Modoc							10,000		25,000 00
Mono									
Monterey									
Napa				250	20	50 00	4,441	2 38	11,575 00
Nevada							22,283	1 79	39,900 00
Placer							11,943		30,546 00
Plumas				2,000	25	5,000 00	2,500	1 25	3,125 00
Sacramento				44,450	18	8,075 00	6,267	2 27	14,225 00
San Benito			1,000 00						
San Bernardino									
San Diego							167		617 00
San Francisco			308,235 00			32,140 00			8,668 00
San Joaquin							4,934	2 28	11,278 00
San Luis Obispo							240	2 86	686 00

San Mateo							1,193	2 25	2,680 00
Santa Barbara							50	3 10	155 00
Santa Clara				71,100	25	17,775 00	8,165	4 00	32,660 00
Santa Cruz							1,096	14 42	15,805 00
Shasta							708	2 71	1,920 00
Sierra							250	90	225 00
Siskiyou							300	2 00	600 00
Solano									
Sonoma				8,720	20	1,644 00	3,910	1 50	5,417 00
Stanislaus							2,290	3 00	6,870 00
Sutter							495	1 30	645 00
Tehama							700	3 00	2,100 00
Trinity									318 00
Tulare							2,275	3 00	6,885 00
Tuolumne									
Ventura									
Yolo				500	20	100 00	5,420		11,975 00
Yuba				45,000	25	11,250 00	2,446	2 25	5,503 00
Totals			$313,557 00	187,570	$0 25	$86,341 00	124,515	2 51	$322,379 00

SCHEDULE T.—Continued.

COUNTIES.	LUMBER.			COAL.			QUICKSILVER IN FLASKS.	FARMING UTENSILS.	GOODS, WARES, AND MERCHANDISE.
	Number Feet.	Average Value.	Total Value.	No. Tons.	Average Value.	Total Value.	Total Value.	Total Value.	Total Value.
Alameda	168,750		$118,425 00	1,369	$6 01	$8,230 00		$18,920 00	$910,070 00
Alpine	120,000		1,260 00					745 00	6,170 00
Amador									
Butte	500,000	$15 00	75,000 00				$7,500 00	42,000 00	504,000 00
Calaveras	61,300	18 00	1,106 00				105 00	7,697 00	185,021 00
Colusa	1,075,000		19,293 00					63,232 00	134,520 00
Contra Costa	560,000	16 00	8,960 00					53,500 00	110,000 00
Del Norte	997,018	6 00	6,409 00					1,147 00	31,613 00
El Dorado	741,000	7 00	5,190 00					9,785 00	136,530 00
Fresno	55,500		5,211 00					23,573 00	129,691 00
Humboldt	3,928,000		39,077 00					18,131 00	309,654 00
Inyo	15,000							7,033 00	86,442 00
Kern	364,000	16 00	5,826 00	1,117	10 00	11,170 00		15,594 00	143,856 00
Lake	315,400	10 00	3,154 00				2,760 00	7,099 00	67,072 00
Lassen	300,000	6 00	1,800 00						35,500 00
Los Angeles	3,452,000	17 83	61,565 00	675	12 50	8,437 00		31,363 00	432,322 00
Marin			20,380 00					7,390 00	65,779 00
Mariposa	340,500	11 37	3,874 00				50 00	2,772 00	72,601 00
Mendocino	4,000,000		61,941 00					16,823 00	181,508 00
Merced	100,000	26 00	2,600 00					33,043 00	138,550 00
Modoc								10,101 00	104,009 00
Mono	500,000		15,000 00					7,904 00	212,000 00
Monterey	1,115,000	8 00	8,920 00					30,895 00	130,780 00
Napa	628,000	10 38	6,521 00	55	8 18	450 00	1,785 00	19,212 00	228,095 00
Nevada	8,675,000	4 81	41,675 00					3,915 00	508,985 00
Placer	4,283,439		32,350 00					11,889 00	181,513 00
Plumas	180,000	20 00	3,600 00				1,000 00	13,000 00	135,000 00
Sacramento	685,000	25 73	17,625 00					72,255 00	2,092,595 00
San Benito	150,000	10 00	1,500 00					13,150 00	130,000 00
San Bernardino	111,500	10 00	1,115 00					3,641 00	26,765 00
San Diego	460,600		8,987 00	248		2,465 00		6,931 00	127,856 00
San Francisco			662,342 00	27,051		189,357 00	20,000 00		16,145,818 00
San Joaquin			3,935 00	610	8 47½	5,170		36,861 00	532,769 00
San Luis Obispo	907,000	15 14	13,740 00					12,178 00	189,230 00

San Mateo	592,000	9 44	5,690 00					9,130 00	72,255 00
Santa Barbara	553,000	15 00	8,295 00					11,837 00	101,309 00
Santa Clara	4,785,000	10 00	47,850 00	121	8 00	968	5,500	31,275 00	565,785 00
Santa Cruz	2,120,000		16,960 00					8,998 00	160,711 00
Shasta	649,000	8 47	5,497 00	3	25 00	75		14,885 00	152,891 00
Sierra	288,000		3,350 00					4,275 00	112,776 00
Siskiyou	560,000	8 00	4,480 00						200,000 00
Solano								52,549 00	246,965 00
Sonoma	1,335,000	10 00	13,200 00				100	26,390 00	360,100 00
Stanislaus			5,823 00					29,712 00	196,105 00
Sutter			450 00					29,075 00	26,320 00
Tehama	2,000,000	12 00	24,000 00					28,855 00	194,600 00
Trinity			2,170 00				200	4,663 00	71,826 00
Tulare	367,000		4,315 00					16,553 00	127,282 00
Tuolumne									
Ventura	999,000		22,152 00					10,416 00	90,195 00
Yolo			16,806 00					40,464 00	180,265 00
Yuba			37,500 00	114	24 78	2,825		16,130 00	364,485 00
Totals	84,137,007		$1,476,917	31,363		$229,147 00	39,000	$937,046 00	$27,650,184 00

SCHEDULE T.—Continued.

COUNTIES.	MACHINERY.	WAGONS AND OTHER VEHICLES.			HARNESS, ROBES, SADDLES, ETC.	SEWING MACHINES.			FURNITURE.
	Total Value.	Number.	Average Value.	Total Value.	Total Value.	Number.	Average Value.	Total Value.	Total Value.
Alameda	$216,225 00	3,953	--------	$218,070 00	$32,920 00	1,208	$20 85	$25,188 00	$944,411 00
Alpine	4,175 00	83	--------	5,730 00	1,534 00	37	--------	823 00	4,697 00
Amador	--------	--------	--------	--------	--------	--------	--------	--------	--------
Butte	85,000 00	2,800	$50 00	140,000 00	32,000 00	--------	--------	5,000 00	92,000 00
Calaveras	5,030 00	864	50 75	43,854 00	10,771 00	--------	--------	10,229 00	49,831 00
Colusa	103,079 00	2,684	51 44	139,091 00	49,175 00	--------	--------	35,403 00	90,870 00
Contra Costa	20,080 00	1,350	40 00	5,400 00	4,625 00	--------	--------	16,010 00	61,370 00
Del Norte	6,325 00	170	45 20	7,685 00	--------	112	17 42	1,952 00	18,741 00
El Dorado	2,275 00	1,220	53 76	65,590 00	9,945 00	723	20 20	14,610 00	67,090 00
Fresno	25,440 00	1,159	--------	53,944 00	--------	538	--------	8,927 00	36,185 00
Humboldt	26,473 00	1,112	47 41	52,725 00	5,194 00	1,052	14 70	15,449 00	103,848 00
Inyo	11,590 00	496	62 22	30,866 00	12,363 00	153	16 32	2,499 00	16,467 00
Kern	19,012 00	913	54 00	49,303 00	13,918 00	308	19 63	6,045 00	27,105 00
Lake	14,800 00	667	67 67	45,039 00	10,194 00	--------	--------	9,302 00	35,697 00
Lassen	14,418 00	511	63 00	32,193 00	9,758 00	226	20 00	4,520 00	12,599 00
Los Angeles	197,270 00	4,162	42 26	175,905 00	35,335 00	1,745	11 61	20,259 00	195,234 00
Marin	33,375 00	1,162	51 20	59,605 00	6,075 00	308	13 24	4,180 00	98,870 00
Mariposa	20,673 00	421	50 74	21,365 00	6,659 00	210	18 50	3,885 00	17,788 00
Mendocino	166,470 00	1,430	--------	78,454 00	19,370 00	15,482	--------	--------	61,808 00
Merced	125,850 00	1,121	63 00	70,536 00	18,218 00	292	18 00	5,193 00	45,422 00
Modoc	40,539 00	822	57 00	46,830 00	17,473 00	329	21 20	6,980 00	25,554 00
Mono	156,856 00	400	100 00	40,000 00	9,400 00	--------	--------	2,560 00	20,250 00
Monterey	--------	3,467	29 00	89,665 00	61,350 00	2,784	20 00	55,695 00	103,975 00
Napa	51,840 00	2,091	55 52	116,103 00	24,579 00	911	14 86	13,543 00	7,980 00
Nevada	115,320 00	1,176	74 67	87,815 00	11,780 00	1,045	18 35	19,175 00	123,700 00
Placer	38,390 00	1,241	--------	69,315 00	16,156 00	554	40 18	22,262 00	97,346 00
Plumas	5,000 00	800	--------	40,000 00	9,700 00	400	20 00	8,000 00	38,750 00
Sacramento	172,770 00	4,412	52 07	229,725 00	55,780 00	2,389	19 75	47,210 00	229,440 00
San Benito	34,087 00	1,280	41 00	52,480 00	7,670 00	250	10 00	2,500 00	12,200 00
San Bernardino	35,975 00	1,083	--------	44,478 00	9,966 00	505	15 00	7,575 00	33,213 00
San Diego	27,785 00	838	--------	52,173 00	8,918 00	--------	--------	5,567 00	15,517 00
San Francisco	1,455,318 00	7,370	--------	650,819 00	72,522 00	8,231	--------	138,770 00	4,896,910 00
San Joaquin	157,094 00	3,907	60 70	237,172 00	57,495 00	1,815	21 01	38,137 00	252,543 00
San Luis Obispo	18,433 00	1,181	43 08	50,865 00	16,454 00	563	15 07	8,488 00	37,749 00

San Mateo	55,465 00	1,505	49 38	74,330 00	16,000 00	399	9 90	3,950 00	228.120 00
Santa Barbara	26,814 00	1,357	48 43	65,723 00	13,571 00	--------	--------	7,411 00	66,740 00
Santa Clara	151,325 00	6,785	45 00	304,325 00	27,875 00	--------	--------	11,250 00	341,460 00
Santa Cruz	27,811 00	1,793	34 14	61,225 00	10,718 00	830	10 00	8,300 00	62,348 00
Shasta	29,623 00	1,069	48 30	56,472 00	16,667 00	--------	--------	11,693 00	32,219 00
Sierra	--------	329	--------	19,403 00	3,876 00	220	--------	4,504 00	29,420 00
Siskiyou	44,000 00	--------	--------	68,800 00	12,000 00	300	15 00	4,500 00	50,600 00
Solano	74,589 00	2,005	47 11	94,453 00	--------	683	14 31	10,687 00	99.083 00
Sonoma	91,430 00	4,220	50 00	209,310 00	41,520 00	1,823	15 00	28,110 00	269.310 00
Stanislaus	74,293 00	1,726	--------	111,112 00	28,585 00	--------	--------	11,334 00	52,642 00
Sutter	48,340 00	1,626	50 50	82,243 00	18,149 00	501	23 00	11,664 00	29,998 00
Tehama	50,200 00	1,368	41 08	56,191 00	15,000 00	--------	--------	--------	45.150 00
Trinity	7,186 00	208	67 62	14.015 00	4.321 00	161	19 13	3,090 00	13,905 00
Tulare	35,302 00	2,354	33 00	79,160 00	17,753 00	870	14 00	12,270 00	34,738 00
Tuolumne	--------	--------	--------	--------	--------	--------	--------	--------	--------
Ventura	18,627 00	790	--------	40,002 00	10,723 00	395	--------	6,009 00	87,111 00
Yolo	66,033 00	1,988	69 00	133,275 00	31,792 00	--------	--------	20,038 00	96,369 00
Yuba	53,920 00	1,388	56 26	78,100 00	11,655 00	470	21 34	10,030 00	94,062 00
Totals	$4,261,925 00	86,857	--------	$4,050,934 00	$937,532 00	48,812	--------	$730,776 00	$9,508,435 00

Schedule T.—Continued.

Counties.	Consigned Goods.	Firearms.			Fixtures of Saloons, Stores, and Other Business Places.	Libraries — Law, Medical, and Miscellaneous.
	Total Value.	Number.	Average Value.	Total Value.	Total Value.	Total Value.
Alameda		213	$17 30	$3,685 00	$53,561 00	$36,851 00
Alpine				614 00		1,005 00
Amador						
Butte	$5,700 00			6,200 00	25,000 00	5,000 00
Calaveras				4,691 00	6,006 00	1,062 00
Colusa				13,689 00	13,500 00	6,790 00
Contra Costa				1,910 00	6,570 00	2,890 00
Del Norte		139	13 79	1,818 00	2,553 00	1,417 00
El Dorado		525	9 59	5,035 00	14,135 00	4,125 00
Fresno				5,350 00	2,145 00	3,736 00
Humboldt		703		7,260 00	19,384 00	5,760 00
Inyo		214	14 52	3,106 00	8,585 00	1,070 00
Kern		340	11 40	3,876 00	5,429 00	3,260 00
Lake	15 00	365	22 57	8,238 00	4,082 00	2,455 00
Lassen		400		3,200 00	800 00	800 00
Los Angeles	1,500 00			6,498 00	24,050 00	12,370 00
Marin	8,000 00	46		1,058 00	5,755 00	4,750 00
Mariposa		341	10 26	3,500 00	4,700 00	580 00
Mendocino		856		11,054 00	8,183 00	5,227 00
Merced	10,000 00	181	14 00	2,510 00	12,650 00	3,030 00
Modoc		472	12 63	5,962 00	1,830 00	1,375 00
Mono				1,265 00	12,325 00	1,500 00
Monterey		673		6,845 00	20,760 00	3,570 00
Napa	1,493 00	540	12 44	6,719 00	7,980 00	9,540 00
Nevada				5,200 00	26,090 00	10,515 00
Placer		488	18 92	9,234 00	6,107 00	4,490 00
Plumas	2,000 00	250	12 00	3,000 00	12,000 00	5,000 00
Sacramento		1,012	12 83	12,985 00	77,075 00	25,625 00
San Benito				375 00	2,350 00	1,100 00
San Bernardino		396	12 50	4,950 00	330 00	787 00
San Diego				3,752 00	8,359 00	2,179 00
San Francisco	284,703 00	861	13 00	11,846 00	824,209 00	181,845 00

San Joaquin	2,085 00	734	14 21	10,429 00	45,155 00	13,875 00
San Luis Obispo				4,709 00	11,813 00	4,240 00
San Mateo		200	11 00	2,210 00	4,935 00	9,665 00
Santa Barbara		358	11 03	3,951 00	7,097 00	7,340 00
Santa Clara	5,000 00			5,375 00	41,325 00	15,475 00
Santa Cruz		230	10 00	2,300 00	9,498 00	4,160 00
Shasta		669	11 53	7,752 00	4,858 00	1,454 00
Sierra		58		1,440 00	6,235 00	1,220 00
Siskiyou		600	9 00	5,400 00	8,000 00	1,500 00
Solano					12,352 00	4,315 00
Sonoma	2,000 00	1,310	7 00	9,475 00	163,449 00	9,840 00
Stanislaus	1,500 00			5,814 00	9,667 00	5,070 00
Sutter		390	11 50	4,525 00	3,190 00	1,985 00
Tehama		95	12 00	1,140 00	2,750 00	4,000 00
Trinity		207	16 46	3,409 00		665 00
Tulare		727	9 00	6,551 00	10,875 00	3,755 00
Tuolumne						
Ventura				3,889 00	4,457 00	3,362 00
Yolo		368	14 00	5,521 00	20,115 00	800 00
Yuba	650 00	160	18 06	2,890 00		4,930 00
Totals	$324,646 00	15,121		$252,205 00	$1,582,274 00	$447,355 00

SCHEDULE T.—Continued.

COUNTIES.	MUSICAL INSTRUMENTS.			WATCHES.			Franchises not assessed by Board of Equalization—Total Value.	Railroad rolling stock not assessed by State Board of Equalization—Total Value.
	Number.	Average Value.	Total Value.	Number.	Average Value.	Total Value.		
Alameda	35	$792 57	$27,740 00	1,260		$40,403 00	$18 75	$6,450 00
Alpine	11	34 00	380 00	51		1,574 00		
Amador								
Butte			26,000 00			19,000 00		
Calaveras			2,614 00	826	$10 00	8,266 00		
Colusa			11,288 00	688	29 76	20,467 00		
Contra Costa			5,500 00	204	40 00	8,140 00	1,500 00	20,011 00
Del Norte	66	112 27	7,410 00	160	21 30	3,408 00		
El Dorado			16,310 00	766	21 67	16,820 00	200 00	
Fresno			8,443 00	452		8,052 00		
Humboldt	291	99 00	28,821 00	623	24 42	15,214 00	125 00	12,950 00
Inyo			1,090 00	160	30 23	4,838 00	1,600 00	
Kern			1,007 00	219	26 00	5,694 00		
Lake			22,707 00	605	9 77	5,911 00		
Lassen			2,045 00	167	24 00	4,008 00		
Los Angeles			35,277 00	1,139	17 87	20,356 00	58,328 00	22,150 00
Marin	24		1,520 00	162	44 01	7,230 00	12,500 00	
Mariposa			1,922 00	198	26 74	5,295 00		
Mendocino			23,975 00	701		17,799 00	1,400 00	21,100 00
Merced	45	72 00	6,860 00	246	34 10	8,411 00	20,100 00	
Modoc			4,260 00	260	20 00	5,168 00		
Mono			3,000 00	523		5,230 00		
Monterey	356		35,600 00	3,175	12 00	38,130 00	30,800 00	
Napa	158	61 04	9,645 00	828	24 93	20,649 00	6,719 00	
Nevada	463	99 77	46,195 00	714	40 03	28,580 00	6,000 00	
Placer	152	174 44	26,515 00	815		24,430 00	1,150 00	
Plumas	100	100 00	10,000 00	300		3,000 00		
Sacramento			5,585 00	4,936		85,000 00		
San Benito			200 00	125		2,625 00		
San Bernardino			5,850 00	396		9,108 00		
San Diego			6,157 00	427		8,220 00	5,000 00	
San Francisco	6,030		733,940 00	7,087		253,825 00	14,900,900 00	173,100 00
San Joaquin	786	121 88	95,800 00	1,637		49,684 00		
San Luis Obispo			8,298 00	383	19 21	7,339 00	12,600 00	12,500 00

San Mateo	134	20 00	2,660 00	312	21 37	6,670 00	1,070,000 00	
Santa Barbara			1,108 00	460	20 99	9,658 00	12,250 00	
Santa Clara			11,765 00	1,541	23 00	35,443 00	180,000 00	18,500 00
Santa Cruz	640	33 85	21,676 00	1,500	9 00	13,500 00		
Shasta			3,982 00	469	26 13	12,258 00	6,650 00	
Sierra			3,300 00	165		7,306 00		
Siskiyou			6,300 00	370	30 00	11,100 00	3,100 00	
Solano	271	76 23	20,599 00	509	26 00	13,238 00		
Sonoma	730	100 00	72,050 00	1,510	20 00	31,720 00	35,307 00	11,350 00
Stanislaus			24,845 00	531		15,848 00		
Sutter	150	54 50	8,190 00	345	21 50	7,529 00		
Tehama	110	100 00	11,000 00	480	20 00	15,000 00	500 00	
Trinity			6,000 00	240	36 06	8,659 00	1,015 00	
Tulare			12,306 00	557	18 00	10,376 00		
Tuolumne								
Ventura			7,287 00	265		4,958 00		
Yolo			37,860 00			18,699 00		
Yuba	225	107 91	24,280 00	382	35 02	13,410 00		
Totals	10,777		$1,494,162 00	39,879		$997,246 00	$16,367,762 75	$298,111 00

Schedule T.—Continued.

Counties.	Shares of Capital Stock.			Solvent Credits after Deduction of Debts—Total Value.	Steamers, Vessels, Watercraft—Total Value.	Storeships and Hulks.			Other Property—Total Value.
	Number.	Value.	Total Value.			Number.	Average Value.	Total Value.	
Alameda	245		$119,914 00	$349,187 00	$75,000 00				$70,801 00
Alpine				4,263 00					
Amador									
Butte	500	$1 50	750 00	214,831 00					
Calaveras				209,980 00					
Colusa				634,008 00					
Contra Costa				436,694 00	3,480 00				
Del Norte				59,282 00	1,570 00				
El Dorado			4,125 00	204,500 00					
Fresno			34,200 00	56,539 00					
Humboldt	1,111	1 00	1,111 00	257,781 00	9,909 00				
Inyo	225		1,725 00	53,027 00	1,500 00				
Kern	10	15 00	150 00	67,519 00					
Lake			1,060 00	99,914 00	5,000 00				19,002 00
Lassen				78,221 00					55,830 00
Los Angeles			15,867 00	221,650 00	12,330 00				296,553 00
Marin	570	70 96	40,450 00	303,776 00	91,350 00				
Mariposa			5,365 00	67,880 00					7,650 00
Mendocino				399,812 00		16		3,325 00	78,538 00
Merced	50		5,000 00	43,650 00					29,090 00
Modoc				56,486 00					
Mono									
Monterey				258,920 00					
Napa			62,856 00	442,375 00	40 00				84,161 00
Nevada			10,325 00	443,660 00					
Placer			21,989 00	367,516 00	10,775 00				1,848 00
Plumas				25,000 00					128,190 00
Sacramento	120,805		595,000 00	1,246,880 00		80	23 50	1,880 00	
San Benito				55,000 00					
San Bernardino				78,389 00					
San Diego	757		16,090 00	166,549 00	2,590 00				3,360 00
San Francisco			5,544,233 00	5,972,677 00	6,856,035 00				4,275,471 00
San Joaquin			527,930 00	1,176,440 00	4,181 50				

San Luis Obispo	447	17 25	7,711 00	1,228,826 00	535 00				27,252 00
San Mateo			303,895 00	295,950 00					30,130 00
Santa Barbara			69,718 00	148,630 00					9,035 00
Santa Clara			272,000 00	1,164,738 00					
Santa Cruz	36,476	54	19,799 00	162,534 00	180 00				24,285 00
Shasta			6,900 00	221,418 00					580 00
Sierra				193,649 00					
Siskiyou				290,000 00					
Solano			226,227 00	165,057 00					310,000 00
Sonoma			8,016 00	1,001,002 00					
Stanislaus	282		14,870 00	194,449 00					43,821 00
Sutter			13,053 00	158,929 00	1,426 00				
Tehama	640	80 00	51,200 00	180,000 00					13,882 00
Trinity				140,000 00					
Tulare	1,370	26 00	35,740 00	157.520 00					7,520 00
Tuolumne									
Ventura			5,138 00	116,226 00					128 00
Yolo				536,765 00					
Yuba			101,360 00	304,605 00					
Totals	$163,488		$8,146,767 00	$20,712,703 00	$7,075,901 00	96		$5,205 00	$5,517,127 00

SCHEDULE V.

Statistics and Agricultural Products for 1879.

COUNTIES.	Land Inclosed, Acres.	Land Cultivated, Acres.	WHEAT.		BARLEY.	
			Acres.	Bushels.	Acres.	Bushels.
Alameda	151,534	235,870	132.800	1,181,800	52,700	1,077,500
Alpine	4,083	2,540	147	3,366	251	9,710
Amador	----------	----------	----------	----------	----------	----------
Butte	371,000	220,000	120,000	1,527,000	50,000	94,000
Calaveras	52,365	20,700	1,100	16,500	3,300	39,600
Colusa	250.801	460,075	390,259	3,806,264	40,705	193,095
Contra Costa	229.970	111,574	89,013	1,335,195	23,010	580,144
Del Norte	1,900	2,012	270	8.200	153	8,450
El Dorado	61,350	8,830	1,445	15,020	1,214	14,334
Fresno	130,110	208,858	23.248	756,156	9,776	42,275
Humboldt	105,347	27,897	3,708	86.600	3,289	55,418
Inyo	14,129	6,818	1,334	26.376	1,291	31,340
Kern	41,244	36,960	7,028	97,257	3,209	107.161
Lake	40,513	14,676	5,520	121.663	3,547	18,305
Lassen	----------	20,049	2,500	55,000	1,700	51,000
Los Angeles	61,000	130,000	31,500	378,000	29,500	590,000
Marin	293,652	14,516	3,419	64,107	7,613	81,003
Mariposa	26,215	6,161	577	10,569	1,704	33,436
Mendocino	224,604	54.248	15,196	305,780	8,714	260,120
Merced	152.267	190,007	154.370	199,127	13,130	145.927
Modoc	52,240	21,115	7,400	220,420	10,124	330,536
Mono	36,500	8,000	600	900	1,000	2,000
Monterey	463,359	201,325	91,025	971,275	50,115	781,725
Napa	150,049	55,445	30,895	442,914	4,858	91,722
Nevada	27,775	6,592	----------	----------	----------	----------
Placer	160,809	61,618	27.230	449,295	7,340	124,780
Plumas	55,000	6,000	1,500	25,000	300	10.000
Sacramento	326,742	129.277	34,782	297,317	49,157	740,000
San Benito	215,000	45,000	30.000	165,000	10,000	60,000
San Bernardino	15.797	11,074	2,118	----------	4,039	----------
San Diego	9,064	29,824	15.285	46,254	6,090	40,268
San Francisco	6,300	3,000	300	----------	250	----------
San Joaquin	360,000	315.725	252,315	3,750,715	40,000	690,000
San Luis Obispo	171,482	68,467	24.348	351,488	20,295	297,370
San Mateo	165,000	81,000	16,500	417,500	20,240	465,520
Santa Barbara	42,250	47,543	19,328	198,293	11,468	214,937
Santa Clara	413,767	253,164	144,575	2,312,600	27,694	553,880
Santa Cruz	85,402	33,152	12,597	211,592	7,174	90,917
Shasta	44,373	17,816	3,509	43,316	3,032	38,788
Sierra	24,961	----------	----------	835	----------	1,200
Siskiyou	205,000	26,600	7,600	121,600	5,600	116,000
Solano	----------	----------	----------	----------	----------	----------
Sonoma	412,755	197,434	72,000	400,000	16,000	80,000
Stanislaus	72,918	337,458	298,978	3,095,655	28,992	375,330
Sutter	280,000	205,000	110.000	1,400.000	30,000	600.000
Tehama	148,200	245,125	125,000	1,250.000	22,000	440,000
Trinity	4,613	2,595	847	12.705	42	630
Tulare	185,320	115,240	76,430	993,590	18,300	301,100
Tuolumne	----------	----------	6,100	85.000	2,200	34.000
Ventura	15,000	753,000	12,000	240,000	24,500	489.832
Yolo	185,684	211,000	187,000	2,110.000	20,000	400,000
Yuba	109,128	53,200	19,867	337,739	5,876	117,520
Totals	6,656,632	5,313,580	2,613,663	29,944,983	701,492	10,920,873

Schedule V.—Continued.

Counties.	Oats.		Rye.		Corn.	
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.
Alameda	2,200	48,000	100	500	3,655	84,250
Alpine	197	3,337	--------	--------	--------	--------
Amador	--------	--------	--------	--------	--------	--------
Butte	200	1,700	--------	--------	1,550	71.550
Calaveras	--------	--------	--------	--------	350	8,750
Colusa	--------	--------	--------	--------	154	4.600
Contra Costa	1,850	45,560	--------	--------	230	6,900
Del Norte	307	11,985	7	200	78	1,650
El Dorado	25	375	158	1,175	--------	--------
Fresno	--------	--------	--------	--------	638	10,476
Humboldt	7,198	260,774	19	1,050	364	10,225
Inyo	317	18,987	--------	--------	1,296	24,776
Kern	80	2,400	8	60	1,420	31,260
Lake	386	9,699	--------	--------	472	13,423
Lassen	606	20.000	100	1,100	60	1,500
Los Angeles	150	3,000	225	3,750	20,000	800,000
Marin	1,478	38,328	--------	--------	--------	--------
Mariposa	22	385	131	1,125	43	725
Mendocino	9,200	250,600	200	3,160	580	13,940
Merced	--------	--------	500	6,000	399	3,990
Modoc	600	22,050	70	2,200	38	640
Mono	200	600	--------	--------	--------	--------
Monterey	5,123	62,572	--------	--------	1,537	16,375
Napa	579	12,810	10	200	1,598	40,593
Nevada	--------	--------	--------	--------	--------	--------
Placer	13,765	--------	--------	--------	--------	--------
Plumas	3,200	65,000	200	6,000	--------	--------
Sacramento	2,900	54,800	90	1,875	3,908	12,744
San Benito	--------	--------	--------	--------	500	15,000
San Bernardino	16	--------	79	--------	167	--------
San Diego	211	416	49	--------	1,276	4,475
San Francisco	30	--------	--------	--------	--------	--------
San Joaquin	200	3,750	8,000	16,000	700	35,000
San Luis Obispo	1,007	31,910	2,075	31,357	1,333	30,075
San Mateo	8,800	264,000	--------	--------	200	8,000
Santa Barbara	30	500	--------	--------	2,079	59,086
Santa Clara	650	16,250	20	400	152	3,800
Santa Cruz	609	10,724	69	63	1,488	19,481
Shasta	822	5,860	16	62	68	675
Sierra	--------	1,500	--------	--------	--------	--------
Siskiyou	2,600	72,800	18	400	260	5,460
Solano	4,000	40,000	--------	--------	60,000	1,000,000
Sonoma	--------	--------	--------	--------	--------	--------
Stanislaus	--------	--------	3,385	23,340	234	11,130
Sutter	250	5,000	--------	--------	1,500	60,000
Tehama	1,500	3,000	800	1,200	800	1,600
Trinity	218	7,671	--------	--------	54	1,620
Tulare	--------	--------	30	240	1,500	39,000
Tuolumne	560	9,000	--------	--------	80	1,600
Ventura	--------	--------	--------	--------	8,150	122,200
Yolo	--------	--------	1,000	30,000	--------	--------
Yuba	635	13,970	--------	--------	110	2,078
Totals	72,721	1,419,333	17,359	131,457	119,021	2,578,647

SCHEDULE V.—Continued.

COUNTIES.	BUCKWHEAT.		PEAS.		PEANUTS.	
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Pounds.
Alameda	4,140	800	2,050	4,900		
Alpine						
Amador						
Butte						
Calaveras						
Colusa						
Contra Costa			12	240		
Del Norte			36	1,625		
El Dorado						
Fresno						
Humboldt			656	17,321		
Inyo						
Kern			3	98		
Lake						
Lassen	20	200	8	160		
Los Angeles	75	1,125	120	3,000	75	75,000
Marin						
Mariposa						
Mendocino						
Merced						
Modoc						
Mono						
Monterey						
Napa			3	80		
Nevada						
Placer						
Plumas			25	1,000		
Sacramento						
San Benito						
San Bernardino	5		2			
San Diego			23	20		
San Francisco			12	75		
San Joaquin		500	20	750	10	2,000
San Luis Obispo	2	120	35	1,094		
San Mateo						
Santa Barbara						
Santa Clara			59	250		
Santa Cruz	10	274				
Shasta	2		8	68		
Sierra						
Siskiyou						
Solano						
Sonoma						
Stanislaus						
Sutter	400	12,000				
Tehama					100	175,000
Trinity						
Tulare						
Tuolumne			16	650		
Ventura						
Yolo			100	7,000	50	6,000
Yuba						
Totals	4,654	15,019	3,168	38,331	235	258,000

SCHEDULE V.—Continued.

COUNTIES.	BEANS.		CASTOR BEANS.		POTATOES.	
	Acres.	Bushels.	Acres.	Pounds.	Acres.	Tons.
Alameda	1,815	5,950			3,470	23,520
Alpine					52	92
Amador						
Butte					60	160
Calaveras	17	117			320	640
Colusa						
Contra Costa	50	1,000	50		893	4,465
Del Norte	11	310			82	215
El Dorado					74	254
Fresno						
Humboldt	54	1,140			1,706	4,714
Inyo	18	383			74	241
Kern	71	1,330			162	310
Lake	28	318			210	10,993
Lassen					200	1,200
Los Angeles	1,250	25,000	350	525,000	2,000	6,000
Marin					1,617	3,425
Mariposa	6		102		69	137
Mendocino					2,450	6,920
Merced					163	640
Modoc					340	510
Mono					150	300
Monterey					1,587	1,738
Napa	15	285			123	1,042
Nevada						
Placer						55
Plumas					200	12
Sacramento					1,430	3,720
San Benito					600	1,100
San Bernardino	23				18	
San Diego	151	70			511	353
San Francisco	8	50				350
San Joaquin	800	18,000			5,000	11,000
San Luis Obispo	4,238	50,283			939	1,691
San Mateo	100	2,000			8,000	20,000
Santa Barbara	5,932	80,931			258	701
Santa Clara	140	1,400			706	1,765
Santa Cruz	453	10,399			332	3,127
Shasta	82	673			50	147
Sierra						100
Siskiyou	22	390			77	525
Solano						
Sonoma					6,000	5,000
Stanislaus					38	128
Sutter	400	14,000			1,000	4,500
Tehama	25	500			100	300
Trinity					56	44
Tulare	75	2,250			450	28,000
Tuolumne	30	900			360	1,440
Ventura	2,200	32,000				
Yolo	400	2,000			400	1,400
Yuba					211	649
Totals	18,414	251,679	502	525,000	41,538	153,623

SCHEDULE V.—Continued.

COUNTIES.	SWEET POTATOES.		ONIONS.		HAY.	
	Acres.	Tons.	Acres.	Bushels.	Acres.	Tons.
Alameda	15	Nominal.	645	50,000	33,050	51.550
Alpine					1,345	1,405
Amador						
Butte	10	30			45,000	43.000
Calaveras			73	2,628	15,000	15,000
Colusa					20,250	25,051
Contra Costa			35	3,350	45,230	67,845
Del Norte					1,068	2.221
El Dorado					3,752	8,063
Fresno					4,428	3.781
Humboldt			2	350	3,890	7,724
Inyo	2½	8	3	298	3,040	5,967
Kern	14	10	3	160	8.414	19,486
Lake					5,644	7,578
Lassen			15	500	15,200	18,595
Los Angeles	275		155	31,000	6,500	13,000
Marin	1,617				5,389	7,469
Mariposa	½	1	3½	310	3,511	3,254
Mendocino					14,600	25,400
Merced	6	12			19,168	2,680
Modoc			13	510	24,100	40,000
Mono					12,000	12,000
Monterey						
Napa			5	150	10,914	14,248
Nevada					2,602	2,900
Placer					1,740	5,150
Plumas			50	2,000	17.000	2,500
Sacramento					44,360	39,432
San Benito					4,000	7,500
San Bernardino					1,033	
San Diego					4,185	3,809
San Francisco						1,000
San Joaquin	22	40	75	5,000	7,000	11.000
San Luis Obispo	20	20	27	885	10,175	16,712
San Mateo			51	7,560	20,000	30,000
Santa Barbara					5,319	7,176
Santa Clara			65	3,900	48,868	97,736
Santa Cruz	1	2			2,680	4,244
Shasta	¾	2	1½	50	6,978	7,205
Sierra						11,640
Siskiyou			9	2,800	8,000	17,950
Solano						
Sonoma					40,000	50,000
Stanislaus					5,731	6.620
Sutter	300	1,200	50	2,500	61,100	90,000
Tehama	20	50	17	800	60,000	60,000
Trinity			2	200	685	1,390
Tulare	25	150	5	225	6.600	13.200
Tuolumne			110	4,400	22,800	21,000
Ventura						
Yolo	200	300	60	4,000	15.000	2,000
Yuba	50	175	4	300	8,721	8,144
Totals	2,578¾	2,000	1,478½	123,877	706,070	913,625

Schedule V.—Continued.

Counties.	Flax.		Hops.		Tobacco.	
	Acres.	Pounds.	Acres.	Pounds.	Acres.	Pounds.
Alameda			60	50,000		
Alpine						
Amador						
Butte						
Calaveras						
Colusa						
Contra Costa						
Del Norte						
El Dorado						
Fresno						
Humboldt						
Inyo						
Kern						400
Lake			20	19,000		
Lassen			2			
Los Angeles			400	240,000	125	125,000
Marin						
Mariposa					½	20
Mendocino			450	590,000		
Merced			40			
Modoc						
Mono						
Monterey						
Napa			46	78,665		
Nevada						
Placer						
Plumas						
Sacramento			240	40,895		
San Benito	200	120,000			60	72,000
San Bernardino	140					
San Diego						
San Francisco						
San Joaquin	75	2,861,275	50	25,000	2	1,100
San Luis Obispo	3,815					
San Mateo	6,293	5,034,400	25	25,000		
Santa Barbara	60	3,000				
Santa Clara			75	98,750		
Santa Cruz						
Shasta	18					
Sierra						
Siskiyou						
Solano						
Sonoma			200			
Stanislaus			100	50,000		
Sutter						
Tehama						
Trinity						
Tulare						
Tuolumne						
Ventura	760	5,679	75	5,000		
Yolo						
Yuba						
Totals	11,361	8,024,354	1,783	1,222,320	187½	198,520

SCHEDULE V.—Continued.

COUNTIES.	COTTON.		SUGAR BEETS.		Butter, Pounds.	Cheese, Pounds.
	Acres.	Pounds.	Acres.	Tons.		
Alameda			2,000	30,000	187,000	
Alpine					35,000	
Amador						
Butte						
Calaveras					124,900	2,000
Colusa					3,889	
Contra Costa			120	3,420	210,341	18,530
Del Norte					260,550	24,750
El Dorado					139,950	12,800
Fresno						
Humboldt			100	800	96,750	1,400
Inyo					12,865	
Kern	1¼	250			19,790	1,475
Lake			8	22	28,997	7,200
Lassen			100	520	52,000	24,000
Los Angeles			150	3,000	85,000	55,000
Marin					3,468,680	68,318
Mariposa					1,950	
Mendocino						
Merced	240	72,000			42,000	6,400
Modoc						
Mono					150,000	
Monterey			307	4,963	17,000	55,000
Napa			15	150	157,350	30,000
Nevada						
Placer					6,000	
Plumas					5,000	6,000
Sacramento					385,000	
San Benito					40,000	350,000
San Bernardino						
San Diego					15,095	2,000
San Francisco						
San Joaquin			3	45	175,000	5,000
San Luis Obispo					1,135,126	786,552
San Mateo					59,000	75,000
Santa Barbara					71,025	500
Santa Clara			150	1,200		
Santa Cruz			27	216	55,988	16,610
Shasta					8,800	
Sierra					60,000	
Siskiyou					130,000	16,000
Solano					3,000,000	500,000
Sonoma						
Stanislaus					125,000	22,000
Sutter						
Tehama					28,000	
Trinity						
Tulare					443,850	
Tuolumne			15	15	21,000	
Ventura						
Yolo						
Yuba						
Totals	241¼	72,250	2,995	44,351	10,957,896	2,066,535

Schedule V.—Continued.

Wool, Honey, and Liquors produced in 1879.

Counties.	Wool, Pounds.	Honey, Pounds.	Wine, No. Gallons.	Brandy, No. Gallons.	Distilleries, No. Gallons.	Breweries, No. Gallons.
Alameda	33,000	500	100,000	1,000		1,418,000
Alpine		2,000				
Amador						
Butte	380,000		15,200	1,000		
Calaveras	285,000	2,910	27,880	1,394		43,700
Colusa	318,920	2,600				
Contra Costa	85,000	2,540	24,370	400,000		10,000
Del Norte	2,160		200			3,000
El Dorado	79,880		58,930	2,119		
Fresno			60,000	15,000		
Humboldt	352,980	575	1,500			20,150
Inyo	27,600	1,225				15,425
Kern	2,126,346	4,000	340			8,800
Lake	202,179		80			10,500
Lassen	200,000	600				
Los Angeles	2,717,890	450,000	2,019,000	85,000		
Marin						
Mariposa	158,230		10,585	135		15,000
Mendocino	1,650,000					25,000
Merced						
Modoc	102,000					40,000
Mono						200,000
Monterey	850,000	7,500				40,000
Napa	140,659	3,500	927,400	26,321		37,600
Nevada			6.000			377,125
Placer	326,551		23,815	1.075	304	130,000
Plumas	20,000	3,000	1,000	2.000		9,000
Sacramento	378,450	3,500	125,850	5,240		
San Benito	175,000		10,000			21,000
San Bernardino			30,000	1,200		
San Diego	415,790	17,840	940			12,300
San Francisco						3,500,000
San Joaquin	272,014	2,500	100,000	5,119		150,000
San Luis Obispo	1,076,382	109,625				25,680
San Mateo	100	2,000	500			46,620
Santa Barbara	714,700	3.000	5,000			6.500
Santa Clara			158,260	57,190	57.190	1,908.000
Santa Cruz			34,900			546.270
Shasta	40,350	50	5,000	200		13.000
Sierra						28,520
Siskiyou	160,000					27,000
Solano						176,240
Sonoma	1,000,000		2,500,000	500,000		
Stanislaus	810,600	2,500	8,400	3,550		30,000
Sutter	120,000		306			10.500
Tehama	1,525,000		7,500		20,000	
Trinity						9.500
Tulare	959,695	27,300	7.000	2,000	2,000	30,100
Tuolumne	1,000	1,600	90,400	2.500	2,500	3,000
Ventura		20,000	10,000	5.000		12,000
Yolo				2.766		72,000
Yuba			18,462	474		
Totals	16,707,476	670,865	6,368,818	1,120,283	81,994	9,031,530

SCHEDULE W.

Fruit Trees and Vines—1880.

COUNTIES.	Lemon Trees.	Orange Trees.	Olive Trees.	Apple Trees.	Pear Trees.	Fig Trees.
Alameda	177	404	940	41,010	36,750	370
Alpine	--------	--------	--------	--------	--------	--------
Amador	--------	--------	--------	--------	--------	--------
Butte	280	506	45	--------	--------	--------
Calaveras	50	150	22	28,840	4,153	1,760
Colusa	25	250	10	6,243	1,288	1,304
Contra Costa	15	55	16	--------	--------	--------
Del Norte	--------	--------	--------	5,408	168	--------
El Dorado	--------	--------	--------	63,227	11,200	695
Fresno	97	960	28	7,427	3,683	5,679
Humboldt	--------	--------	--------	10,457	927	--------
Inyo	--------	--------	--------	834	113	23
Kern	19	16	2	5,643	904	313
Lake	2	2	--------	5,126	836	66
Lassen	--------	--------	--------	11,000	625	--------
Los Angeles	30,250	192,000	3,000	20,500	13,345	7,325
Marin	--------	--------	--------	32,623	3,516	--------
Mariposa	17	39	3	4,735	782	617
Mendocino	--------	--------	--------	56,000	11,000	150
Merced	24	33	--------	12,336	3,332	899
Modoc	--------	--------	--------	420	40	--------
Mono	--------	--------	--------	--------	--------	--------
Monterey	--------	15	--------	1,700	550	75
Napa	--------	58	8	41,186	10,493	735
Nevada	--------	--------	--------	32,943	5,096	685
Placer	520	1,038	101	15,956	3,980	1,658
Plumas	--------	--------	--------	6,000	550	--------
Sacramento	155	440	--------	--------	--------	--------
San Benito	--------	--------	--------	83,000	1,400	300
San Bernardino	2,640	9.050	48	6,363	1,017	1,391
San Diego	870	2,517	2,461	4,418	1,048	2,003
San Francisco	--------	--------	--------	--------	--------	--------
San Joaquin	--------	250	75	40,000	15,000	5,000
San Luis Obispo	20	6	100	2,134	986	694
San Mateo	--------	--------	--------	5,000	2,180	228
Santa Barbara	1.014	315	3,885	9,194	957	854
Santa Clara	591	2,287	1,616	1,280,000	75,400	1,449
Santa Cruz	5	8	--------	21,682	3,599	75
Shasta	2	5	--------	7,733	1,042	288
Sierra	--------	--------	--------	--------	--------	--------
Siskiyou	--------	--------	--------	50,000	2,600	--------
Solano	--------	--------	--------	--------	--------	--------
Sonoma	1,000	3,000	500	130,000	30,000	3,000
Stanislaus	--------	209	--------	1,243	382	302
Sutter	--------	--------	--------	2,600	5,210	3,111
Tehama	--------	--------	--------	--------	--------	--------
Trinity	--------	--------	--------	3,095	459	3
Tulare	5	38	--------	18,500	4,000	2,500
Tuolumne	100	200	--------	40,000	20,000	1.500
Ventura	1,000	1,000	500	10,000	300	300
Yolo	--------	1,000	--------	10.500	20,500	2,500
Yuba	54	202	2	25,115	2,916	557
Totals	38,932	216,053	13,362	2,160,191	302,327	48,389

Schedule W.—Continued.

Counties.	Plum Trees.	Peach Trees.	Quince Trees.	Grape Vines—Acres.	Value of Fruit Crop.
Alameda	46,250	51,155	1,875	558	$392,950
Alpine	----	----	----	----	----
Amador	----	----	----	----	----
Butte	----	----	----	----	----
Calaveras	2,790	12,700	825	100	75,000
Colusa	1,105	5,646	158	18,048	2,555
Contra Costa	----	----	----	425	40,175
Del Norte	281	116	15	9	2,500
El Dorado	22,524	50,100	455	1,604	117,500
Fresno	3,172	26,809	622	560	----
Humboldt	1,223	2,550	----	234	2,000
Inyo	435	4,648	40	5	2,750
Kern	1,244	5,880	38	32	9,830
Lake	864	2,225	578	35	5,260
Lassen	500	1,000	300	2	----
Los Angeles	3,125	24,575	1,900	6,235	655,000
Marin	1,063	878	33	----	----
Mariposa	579	2,649	106	94	2,910
Mendocino	15,000	46,200	200	300	12,500
Merced	922	10,716	459	121	28,000
Modoc	10	145	----	4	820
Mono	----	----	----	----	----
Monterey	250	175	35	----	----
Napa	5,914	17,669	830	3,967	214,671
Nevada	3,414	7,365	814	152	4,171
Placer	4,380	14,148	617	677	----
Plumas	400	1,800	60	5	6,000
Sacramento	----	----	----	2,540	454,000
San Benito	2,500	6,780	----	342,000	8,500
San Bernardino	954	15,330	187	375	----
San Diego	276	5,541	276	164	10,285
San Francisco	----	----	----	----	----
San Joaquin	8,000	8,000	1,500	525	10,000
San Luis Obispo	357	1,482	350	26	5,275
San Mateo	1,603	2,416	173	110	2,000
Santa Barbara	3,372	3,435	402	104	1,665
Santa Clara	52,175	87,570	2,150	15,160	500,000
Santa Cruz	3,031	5,837	216	1,203	11,265
Shasta	911	7,190	73	446	8,815
Sierra	----	----	----	----	----
Siskiyou	3,800	11,000	----	----	2,400
Solano	----	----	----	----	----
Sonoma	25,000	100,000	2,000	----	----
Stanislaus	259	1,718	29	30	4,550
Sutter	8,432	48,000	1,751	50	20,000
Tehama	----	----	----	----	----
Trinity	182	1,397	----	----	----
Tulare	2,300	28,000	400	380	80,000
Tuolumne	30,000	20,000	250	900	----
Ventura	1,000	5,000	500	200	----
Yolo	2,750	8,500	500	850	----
Yuba	2,119	7,891	343	192	22,450
Totals	264,466	664,236	21,060	398,412	$2,715,787

SCHEDULE W.—Continued.

COUNTIES.	WOOLEN MILLS.		SAWMILLS.			
	Pounds of Wool Used.	Pounds of Cotton Used.	Steam Power.	Water Power.	Lumber Sawed in 1879—Feet.	Shingles Made in 1879.
Alameda	------	------	------	------	------	------
Alpine	------	------	2	------	800,000	------
Amador	------	------	------	------	------	------
Butte	------	------	14	------	200,000,000	20,000
Calaveras	------	------	5	2	2,800,000	2,000,000
Colusa	------	------	------	------	------	------
Contra Costa	------	------	------	------	------	------
Del Norte	------	------	2	2	8,000,000	100,000
El Dorado	------	------	12	4	7,000,000	------
Fresno	------	------	6	------	5,000,000	------
Humboldt	------	------	18	3	32,349,000	25,110,500
Inyo	------	------	------	2	56,320	100,000
Kern	------	------	3	------	300,000	------
Lake	------	------	3	------	1,020,693	------
Lassen	------	------	3	3	2,000,000	------
Los Angeles	50,000	------	4	------	100,000	------
Marin	------	------	------	------	------	------
Mariposa	------	------	4	1	1,600,090	------
Mendocino	------	------	19	2	40,000,000	1,450,000
Merced	------	------	------	------	------	------
Modoc	------	------	3	8	3,000,000	2,000,000
Mono	------	------	3	7	20,000,000	3,000,000
Monterey	------	------	------	------	------	------
Napa	------	------	1	------	200,000	------
Nevada	------	------	15	1	29,000,000	160,000
Placer	------	------	15	1	22,000,000	------
Plumas	------	------	4	7	4,000,000	1,000,000
Sacramento	------	------	------	------	------	------
San Benito	------	------	------	------	------	------
San Bernardino	------	------	3	------	3,500,000	------
San Diego	------	------	------	1	------	------
San Francisco	2,200,000	------	------	------	------	------
San Joaquin	200,000	------	1	------	1,750,000	------
San Luis Obispo	------	------	3	------	242,000	------
San Mateo	------	------	11	------	2,000,000	10,000,000
Santa Barbara	------	------	------	------	------	------
Santa Clara	300,000	25,000	------	------	------	------
Santa Cruz	------	------	15	2	4,530,000	2,400,000
Shasta	------	------	1	7	2,200,000	2,500,000
Sierra	------	------	10	4	6,190,000	1,800,000
Siskiyou	------	------	2	10	3,535,000	500,000
Solano	------	------	------	------	------	------
Sonoma	------	------	15	------	50,000,000	10,000,000
Stanislaus	------	------	------	------	------	------
Sutter	------	------	------	------	------	------
Tehama	------	------	7	1	35,000.000	------
Trinity	------	------	2	7	2,500,000	200,000
Tulare	------	------	5	1	200,000	------
Tuolumne	------	------	1	3	4,500,000	1.450,000
Ventura	------	------	------	------	------	------
Yolo	------	------	------	------	------	------
Yuba	594,597	------	4	2	2,000,000	------
Totals	3,344,597	25,000	216	81	497,373,013	63,790,500

SCHEDULE W.—Continued.

COUNTIES.	GRIST MILLS.					
	Steam Power.	Run of Stone.	Water Power.	Run of Stone.	Barrels of Flour made in 1879.	Bushels of Corn ground in 1879.
Alameda	5	3	2	3	27,200	24,400
Alpine	--------	--------	--------	--------	--------	--------
Amador	--------	--------	--------	--------	--------	--------
Butte	2	7	2	7	22,500	24,000
Calaveras	--------	--------	--------	--------	--------	--------
Colusa	3	--------	--------	--------	--------	--------
Contra Costa	3	4	--------	--------	4,000	250
Del Norte	--------	--------	1	1	500	75
El Dorado	--------	--------	1	2	--------	--------
Fresno	1	--------	1	--------	--------	--------
Humboldt	2	2	2	2	3,000	--------
Inyo	--------	--------	3	6	2,425	1.984
Kern	2	4	1	3	9.674	8.000
Lake	3	5	2	4	12,200	2,000
Lassen	--------	--------	2	3	3,500	1,000
Los Angeles	4	10	4	4	48,000	110,000
Marin	--------	--------	--------	--------	--------	--------
Mariposa	--------	--------	--------	--------	--------	--------
Mendocino	3	5	2	2	--------	--------
Merced	--------	--------	--------	--------	--------	--------
Modoc	2	2	2	2	30,000	250
Mono	--------	--------	1	2	--------	--------
Monterey	2	4	--------	--------	7,500	500
Napa	2	4	1	2	15,100	7,000
Nevada	--------	--------	--------	--------	--------	--------
Placer	1	2	--------	--------	--------	--------
Plumas	--------	--------	2	--------	2,500	--------
Sacramento	4	--------	--------	--------	--------	--------
San Benito	1	2	1	1	11,000	2,600
San Bernardino	--------	--------	3	5	--------	--------
San Diego	1	2	2	2	4.300	2.150
San Francisco	8	--------	--------	--------	170,000	100,000
San Joaquin	6	29	--------	--------	165.000	15,745
San Luis Obispo	4	6	2	2	7,126	6,378
San Mateo	4	5	--------	--------	2,000	1.500
Santa Barbara	3	6	--------	--------	6,500	5,000
Santa Clara	6	16	1	--------	36,000	9.800
Santa Cruz	2	4	1	1	25.000	32.000
Shasta	--------	--------	2	--------	2,900	300
Sierra	--------	--------	1	3	1,000	--------
Siskiyou	1	2	5	8	9,000	2,600
Solano	4	--------	--------	--------	274,137	--------
Sonoma	5	--------	5	--------	100,000	10,000
Stanislaus	1	4	1	3	--------	--------
Sutter	1	3	--------	--------	--------	--------
Tehama	1	3	1	3	50,000	8,000
Trinity	--------	--------	--------	--------	--------	--------
Tulare	3	7	2	3	24,000	3,000
Tuolumne	--------	--------	4	8	10,000	800
Ventura	--------	--------	2	4	20,000	5,000
Yolo	4	8	--------	--------	75.000	6,000
Yuba	2	12	--------	--------	107,630	16,667
Totals	96	161	62	86	1,288,692	406,999

SCHEDULE W.—Continued.

Counties.	Quartz Mills.	Ditches—Mining.		Ditches—Irrigating.	
	Tons of Quartz Crushed.	Miles in Length.	Average Amount of Water used Daily—Inches.	Miles in Length.	Acres Irrigated.
Alameda				5	500
Alpine	8,450				2,225
Amador					
Butte	3,000	390			
Calaveras	41,500	525	3,253		250
Colusa					
Contra Costa					
Del Norte		65	700		
El Dorado		500			
Fresno				64	100,000
Humboldt					
Inyo	500	6		20	7,450
Kern					47,566
Lake				2	6
Lassen		8		6	15,000
Los Angeles				345	52,515
Marin					
Mariposa	23,275	107			
Mendocino					
Merced					
Modoc				340	24,000
Mono	75,000	40			
Monterey					
Napa					
Nevada	83,570	824			
Placer	3,500	358	378½	40	2,225
Plumas	90,000	500		34	3,500
Sacramento					
San Benito					
San Bernardino					
San Diego	550				
San Francisco					
San Joaquin					
San Luis Obispo					
San Mateo					
Santa Barbara					
Santa Clara					
Santa Cruz				10	350
Shasta	680	650	425	130	1,084
Sierra	70,000	266		20½	
Siskiyou	21,700	250	8,000		23,000
Solano					
Sonoma					
Stanislaus		15		7¼	
Sutter					
Tehama		1½	850	15	800
Trinity		61	9,030		482
Tulare	400	3	40	220	25,000
Tuolumne		190		41	
Ventura				17	1,000
Yolo					20,000
Yuba		57		38	
Totals	422,125	4,751½	22,676½	1,354¾	326,953

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RULES AND REGULATIONS.

Office of the State Board of Equalization,
Sacramento, April 3, 1880.

By authority of Section 3692 of the Political Code, the following Rules and Regulations are prescribed by the State Board of Equalization for the government of County Assessors, and County Boards of Supervisors sitting as Boards of Equalization:

Rule I. The design of the law in the matter of assessing and collecting the public revenue is to carry into effect the constitutional requirement that all property in this State, not exempt under the laws of the United States, shall be taxed in proportion to its value, excepting from taxation, growing crops, property used exclusively for public schools, and such as may belong to the United States, this State, or to any county or municipal corporation within this State. To this end the law requires the assessment of all taxable property in the State to be first completed before the rate of State or county taxation is determined. The assessment must be completed on or before the first Monday of July of each year, and the equalization by the County Boards of Equalization must be completed on or before the fourth Monday in July. All taxable property must be assessed at its "full cash value."

The terms "value" and "full cash value" mean the amount at which the property would be taken in payment of a just debt due from a solvent debtor.

Rule II. Assessors are hereby instructed to use the form of statement or assessment list adopted and furnished by the State Board of Equalization, or a form substantially the same; and in all cases to take statements, sworn to and signed by the person assessed, which must be carefully preserved in the office of the Assessor.

Section 3631 remains unchanged, providing that the Assessor may fill out the statement when he presents it, or may require the taxpayer, within such time as the Assessor may appoint, to return the same properly filled out and sworn to.

Rule III. In addition to the affidavit required by Section 3630 of the Code above mentioned, and before taking from any person the statement required by Section 3629 of said Code, the Assessor must administer to such person an oath that he or she will true answer make to all questions put to him or her concerning all matters contained in said last mentioned section. In this connection attention is called to the explicit provisions of Section 3629 as to the statement to be made by taxpayers. The object of the section is to obtain a complete and detailed list of the taxpayer's taxable property owned by him on the first Monday of March of each year.

RULE IV. Attention is called to Section 3633, where the Assessor is required to make a valuation of the property of persons failing or refusing to make proper statements of their property. The action of the County Assessor is final. The Board of Supervisors have no power to reduce such assessment; and the County Auditor must, in all cases, ignore any attempt of said Board to reduce the same. The Board of Supervisors may, however, raise such valuation as in other cases.

RULE V. Assessors must not assess the property of any person in "gross," but after demanding and receiving from each person to be assessed a specific statement, setting forth in detail, and in accordance with the assessment lists, the quantity, number, or kind of each class of property assessed, the Assessor will then fix the proper values at which the several properties are to be assessed, according to his own judgment, governed by the requirements of the Codes and these Rules. If the person being assessed makes any statement of the value of the property, or any portion thereof, whether under oath or not, the Assessor should consider the same, but will not be bound thereby, but must assess such property at its "full cash value."

RULE VI. Assessors must not accept returns or statements from agents for persons, when the persons themselves can be found in the county.

RULE VII. Care should be taken, when assessing unsecured solvent credits, to bear in mind that it is the intention of the law to assess all unsecured credits due and owing to the party assessed by all non-residents as well as residents of this State; but in making deductions from the aggregate amount of such credits, allowance must be made only for such unsecured debts as the assessed party owes to bona fide residents of this State. The only deductions allowable on account of debts of the party assessed from credits due to him, and which are to be assessed to him as solvent credits, are debts which are not secured by mortgage, trust deed, or other lien on real or personal property due by him to bona fide residents of this State, and which are also not secured by mortgage, trust deed, or other lien on real or personal property.

RULE VIII. In assessing corporations, associations, and joint stock companies, having their principal place of business in this State, the following rule is to be observed:

First—The property of all kinds of such corporation, association, or company, including its franchise, but not including its capital stock, must first be assessed.

Second—The aggregate market value of the full amount of the capital stock issued must then be ascertained. If such aggregate market value exceeds the aggregate assessed value of all other property, the amount of such excess must be divided by the entire number of shares issued; and each share must be assessed to the owner or holder thereof for its proportionate value of such excess.

Third—The owner or holder of shares of the capital stock of a corporation, association, or joint stock company, whose principal place of business is not in this State, must be individually assessed for the full value of such shares of stock without any deduction on account of the assessment of any property of such corporation, association, or company in this State or elsewhere. Shareholders are required, in making out their assessment lists, to specify the number of shares held by them, with the name of the corporation or company, and, in order to be assessed as above mentioned, must produce to the Assessor a certificate of the assessment of the property of the corporation or company.

Rule IX. What is known as a *special deposit* of money or other valuables, in a bank, or with a banker or other person—that is to say, a deposit by the terms of which the custodian of the deposit has no right to the use of the same, but is merely charged with the duty of safely keeping it for the benefit of the depositor—is not to be assessed to such bank, banker, or other person, but such deposit must be assessed to the depositor. In case such depositor resides in another county, the Assessor must immediately, by mail or express, inform the Assessor of the proper county of the nature, amount, and place of deposit, and of the name of the depositor. In case such depositor is absent from the State, the deposit must be assessed to the bank, banker, or other person in whose keeping the same remains, specifying in the assessment that said bank, banker, or other person, is assessed for such deposit as the agent of the owner, naming such owner.

Rule X. Banking corporations, and all banks and banking firms or associations, or persons doing a banking business, must be assessed for the full amount of money, gold dust, or bullion, on hand (except the special deposits mentioned in Rule No. IX); and, in addition thereto, under the head of solvent credits, all their loans, and all solvent credits due them which are secured by mortgage, or other lien upon real or personal property, must be assessed at the full cash value thereof, without any deduction on account of any indebtedness, and notwithstanding the creditors (or depositors, as they are commonly called), of such corporations, banks, banking firms, associations, or persons, may have been, or may be liable to be, assessed for their said deposits or credits, as solvent credits due them. With respect to such solvent credits as are not secured in the manner above stated, the excess of the same over the amount of the same party's indebtedness which is not secured in the manner above stated, only is to be assessed.

Rule XI. The term "*solvent debts*" include all debts owing by any such institutions or persons as are mentioned in Rule No. X, to their creditors or depositors, on account of moneys or securities loaned to or deposited with them (excepting the *special deposits* described in Rule No. IX), and such debts must be severally assessed at their full cash value, as solvent credits, to such creditors or depositors, or such other persons as at the time of assessment may be the owners or holders of such credits, subject to the deduction allowed on account of unsecured indebtedness, as required in Rule No. VII. State, county, city and county, city, and all municipal bonds, warrants, or scrip, are to be assessed as unsecured solvent credits, from which the assessed party may deduct his unsecured debts due bona fide residents of this State.

Rule XII. In assessing solvent credits, whether the same are secured by mortgage, trust deed, contracts, or other obligations, or are unsecured, they are to be valued only at the actual value of the security—that is to say, if the face value of the mortgage is greater than the value of the property, the mortgage should be assessed at no greater value than the property, and so in the case of all other credits secured on either real or personal property, the credit should be assessed at no greater value than the security. In the case of unsecured credits, the same should be assessed at their real value, which may, in many instances, be less than the par value.

Rule XIII. Care should be taken so as not to assess money loaned out, or money loaned to or deposited with banks or banking associations *as money*, but such property must be assessed to the owners or holders as solvent credits. In assessing any credits due any person, association, or corporation, the present cash value of the credit is to be ascertained, as near as may be, by taking into consideration the nature of the indebtedness, the ability of the debtor to pay the same, in whole or in part; the character and sufficiency of the security, if any there be; the times when payable, and such other circumstances as have a present and direct effect upon the value.

Rule XIV. The July statement required for the State Board of Equalization by Section 3655, must be furnished in all cases, and the forms furnished by the Board for that purpose must be fully filled up. The duplicate assessment book required to be prepared by the Auditor for the Tax Collector, must in all cases be furnished, with the affidavit attached, as required by Section 3732, except when expressly dispensed with by order of the Board of Supervisors, as provided in Section 3738. The statements required of the Auditor by Sections 3728 and 3729 are important, and a penalty for non-compliance is provided by Section 3737. The Board of Supervisors of each county is required by Section 3893 to make proper compensation therefor.

Rule XV. Lands and the improvements thereon must be separately assessed.

"Cultivated and uncultivated land of the same quality and similarly situated, shall be assessed at the same value."

The above is the literal command of both the Constitution and the Code, and it will require great care on the part of the Assessor in conforming to it. If the uncultivated land here referred to is land of like quality, and situated in like manner as cultivated lands adjoining, or in the same vicinity, but is not in a condition to be cultivated by reason of not having been reclaimed from its natural state and condition, or not having been cleared from natural obstructions necessary to be removed, in order to cultivate the same, then such land, though similarly located, is not similarly situated with the cultivated land, within the meaning of the Constitution and the Code. The Constitution, in the section immediately preceding the one from which the above language is quoted, provides that all property "shall be taxed in proportion to its value, to be ascertained as provided by law."

The Legislature has declared that "all taxable property must be assessed at its full cash value," and that "full cash value" means "the amount at which the property would be taken in payment of a just debt due from a solvent debtor." Such uncultivated lands, therefore, as those last above described, must not be assessed at more than their actual cash value, in the condition in which they are found by the Assessor. There are, however, in this State, large amounts of uncultivated land which need no reclamation or clearing, and which are ready for the plow, and which may be assessed at the same value as cultivated lands of like quality and situation, without violating the above mentioned full cash value rule; and when such is the case, they must be so assessed.

Rule XVI. Lands must be assessed in parcels or subdivisions, not exceeding six hundred and forty acres each; and tracts of land containing more than six hundred and forty acres, which have been sectionized by the United States Government, must be assessed by sections or fractions of sections. The attention of Assessors is directed to Section 3634 of the Code, as amended, which provides the means for the Assessor to speedily obtain, through the medium of the Courts, a survey of tracts of land when the owner or agent fails or neglects to furnish the statement required by the law.

Rule XVII. Leased lands should be assessed to the lessor or landlord. Mortgaged lands should be assessed to the mortgagor or owner.

Rule XVIII. Money due from any savings bank or other banking corporation or association doing a banking business, on account of deposits, must be assessed to the depositor in the county where such depositor resides.

Rule XIX. Water ditches constructed for mining, manufacturing, or irrigation purposes, and wagon or turnpike toll roads or telegraph lines, and all improvements attached to such properties, must be listed by the Assessor as real estate. (Vide Sec. 3663 as amended.) The Assessor of each county must assess the portion of such property at a rate per mile for the portion situated in his county.

Rule XX. Where ferries connect more than one county, the wharves, storehouses, and all stationary property belonging to or connected with such ferries, must be assessed and the taxes paid in the county where located. The value of the franchise and water craft, and of toll bridges connecting more than one county, must be assessed in equal proportions in the counties connected by such ferries or toll bridges. (Vide Sec. 3643.)

Rule XXI. All franchises must be separately assessed, and entered on the assessment book, without combining the same with other property or the valuation thereof. (Sub. 15 of Sec. 3650.) Franchises granted by a county, city and county, or city, must be assessed in the county, or city and county, in which they were granted. When granted by any other authority, they must be assessed in the county where the principal place of business of the holders thereof is situated. (Sec. 3628.)

Rule XXII. Attention is directed to the important changes and amendments to the Codes, relative to the assessment of property belonging to railroad corporations. Assessors will assess *all property* of any character, including the franchise, belonging to any railroad corporation operated *exclusively* within their county, and also all the depots, station grounds, shops, buildings, gravel beds, and other taxable property situated within their counties, of railroads operated in part in the county, and not included in the franchise, roadway, roadbed, rails, or rolling stock thereof. The State Board of Equalization will assess the franchise, roadway, roadbed, rails, and rolling stock *only*, of all railroads operated in more than one county. The apportionment for each county will be furnished to the Assessors, which assessment must be entered on the assessment book of the county.

Rule XXIII. Salt marsh and tide lands, overflowed lands, school lands, and all other lands purchased of the State, by payment in whole or in part, must be assessed at their full cash value to such purchasers, or their assigns, or legal representatives. Preëmption claims to lands should be listed as the possession, interest, and claim of A. B. in and to the tract of land described as follows (describing the land). If, however, the entire purchase money has been paid by the preëmptor, and a certificate issued therefor, the land itself must be assessed to such preëmptor, notwithstanding the patent has not issued.

Rule XXIV. Timber upon mineral lands, when such timber is owned by railroad companies under the provisions of Section 3 of the Act of Congress of July first, eighteen hundred and sixty-two, and Acts amendatory of and supplemental thereto, must be assessed to the railroad company to which such timber belongs. Such timber, as well as all mines and quarries, belonging to individuals or corporations, and situated upon lands of the United States, are deemed real estate, and must be assessed to such individuals or corporations.

Rule XXV. What are known as "consigned goods," in the possession of any person in this State, consigned to such person from any place out of this State for sale, are required by Section 3638 of the Political Code to be assessed as other property. The only exception allowable to this general requirement is in cases where goods consigned from a foreign State or country remain, and at the time of assessment are in unbroken or unopened original packages, in the hands of the importer or consignee.

Rule XXVI. The attention of Assessors, Collectors, and Treasurers is called to what is known as the "Migratory Stock Act," passed March sixteenth, eighteen hundred and seventy-four (Statutes 1873–4, page 376). A separate list of such stock should be made, a copy of which should be immediately sent to the Treasurer of the county to which the stock is to be removed.

The following form of such list will be sufficient:

MIGRATORY STOCK.

From the Assessment List of ——, made in —— County, on ——, the —— day of ——, eighteen hundred and eighty- ——.

	Number.	Value, $.	To what County Removed.
Horses			
Mules			
Cows			
Stock Cattle			
Sheep			
Lambs			
Hogs			

I, ——, do swear that the above described property is embraced in my Assessment List for the present year, and that it is my intention, at some time during the present fiscal year, to remove the same, for pasturage, to the county above mentioned.

—— ——.

Subscribed and sworn to before me, this —— day of ——, eighteen hundred and eighty- ——.

—— ——, County Assessor.

—— ——, Deputy.

Rule XXVII. Under the Constitution there can be no exemptions from poll tax by male inhabitants over twenty-one and under sixty years of age, except paupers, idiots, insane persons, and Indians not taxed. As will be seen by Section 3839 of the Code, no exemption is allowed to the militia, firemen, or to persons performing any other public service whatever. Assessors must keep a roll of the names and places of residence, or business, of all persons liable for poll tax, upon which must be marked the date of all payments, and, if the tax is not paid, the cause of non-payment. Personal demand for the tax must be made, otherwise the person not paying cannot be returned as delinquent. The law governing the collection of poll taxes will be found in Chapter 9, of Title 9, of Part 3, of the Political Code.

Rule XXVIII. Attention is invited to Section 3658 of the Political Code, whereby it is made the duty of Supervisors to provide maps of all the lands in the county for the use of the Assessors—the cost of such maps to be paid from the County General Fund. It is recommended that a county map should be provided in each county, lithographic copies of which could be cheaply furnished to each Deputy Assessor. The cost of a map made from a complete survey of all the lands in the county would be small, compared with the advantages it would be to the officers, as well as the people of the county.

Rule XXIX. Assessors are requested carefully to study all the sections of the Political Code relative to the assessment of property, numbered from 3607 to 3678, inclusive. By consulting Sections 3632, 3633, 3634, 3640, 3648, and 3649, above mentioned, and Sections 429, 430, and 19 of the Penal Code, Assessors will perceive they are clothed with ample means to discover taxable property and ascertain the value thereof, and power to enforce obedience to the law on the part of persons liable to assessment. When occasion requires it, these powers should be used without fear or hesitation. The liability incurred by Assessors for neglect of duties should also be carefully observed. (Vide Sections 3656, 3660, 3661, 3662, 3697, and 3698, Political Code.)

Rule XXX. The Assessor must supervise the valuations of his deputies, and correct or change them according to his own judgment. Where the labor of assessing is apportioned in districts to different deputies, great inequalities between the several districts are apt to result, unless the Assessor personally attends to fixing the valuations, and making them in proportion throughout the country, according to the true values of the lands or other properties assessed.

Rule XXXI. Assessors must transmit to this Board, as soon as practicable, a statement of all mortgages, deeds of trust, contracts, and other obligations by which any debt is secured, and which embrace or relate to lands in more than one county, in order to enable the Board to apportion the value of such instrument in each county, and transmit such apportionment to the Assessors of such counties, as required by Section 3678. Such statement, in addition to a full description of the names, dates, amounts, etc., of the instrument, should contain all information the Assessor may have in relation to the character and value of the lands described in such instruments. The County Recorder will annually furnish the Assessor with a list of all uncanceled mortgages and other obligations given to secure a debt, and not barred by the statute of limitations, remaining on the records of his office on the first Monday of March.

Rule XXXII. In computing the amount due and to be assessed upon a mortgage, trust deed, or other obligation by which a debt is secured, the Assessor must not assess such security at a greater value than the value of the property held by such mortgage, trust deed, or other obligation; also, in computing such amount, the sum which was due upon such mortgage, trust deed, or other obligation, on the first Monday of March, is the value to be assessed, subject, of course, to a deduction, as above mentioned, on account of the value of the property upon which the security rests being less than the sum so ascertained.

Rule XXXIII. Where two or more subdivisions of land, or land assessed in two or more subdivisions, all situated in the same county, city and county, or city, are embraced in one mortgage or other instrument creating a lien upon such lands, the Assessor must apportion the amount of assessment to be deducted from each subdivision on account of the assessment against said mortgage or other instrument, so as to ascertain the taxable surplus of each subdivision.

(Vide Section 3678.) Such apportionment should be made according to the *value* of each separate mortgaged tract.

Rule XXXIV. In assessing a mortgage, trust deed, or other obligation by which a debt is secured, the mortgaged property must be particularly described. The better way is to adopt the same description by which the land is assessed. In all cases a mortgage or other security must be assessed in the county, or city and county, where the property affected thereby is situated.

Rule XXXV. In case any property is found which has been sold to the State for delinquent taxes pursuant to Section 3773, such property must be assessed, not to the State, but in the same manner, and to the same persons, as if it had not yet been so purchased. In case the time of redemption has expired, the property, being the property of the State, must not be assessed.

Rule XXXVI. The statement or list of property furnished the Assessor by a bank, corporation, association, or firm doing a banking business, should contain a full statement and description in detail of every mortgage, deed of trust, contract, or other obligation by which a debt is secured, owned, or in any manner held by them (giving the amount due upon each instrument) on the first Monday of March, at twelve o'clock m.; also, all real and personal property, including all unsecured solvent debts due them at the same time. From the aggregate amount of such unsecured solvent credits (debts due them) a deduction of the aggregate amount of unsecured debts due by them to bona fide residents of this State should be made, the balance, after such deduction, being all of the solvent credits subject to assessment. The above statement should be under oath, as in other cases. The Assessor may examine the books of such bank, corporation, association, or firm, for the purpose of ascertaining the correctness of such statement.

Rule XXXVII. Railroads, and other quasi-public corporations, are not entitled to any deduction from the value of their properties by reason of mortgages or other obligations to secure payment of debts. The other quasi-corporations referred to are such as are formed for the purpose of supplying towns and cities with water or gas, telegraph companies, toll bridges, and toll-road companies, ferries, and corporations of a like public character. (Vide Subdivision 15 of Section 3650.)

Rule XXXVIII. Every male inhabitant of this State over twenty-one and under sixty years of age, except paupers, insane persons, and Indians not taxed, are liable to pay a poll tax. (See Section 3839 of the Code; also, Article 13, Section 12, of the Constitution.)

Rule XXXIX. All lands must be assessed in tracts not exceeding six hundred and forty acres. If a tract contains more than six hundred and forty acres, it is the duty of the owner to subdivide the same, so that each subdivision shall contain six hundred and forty acres or less, and furnish the Assessor with a full and correct description of the same, by metes and bounds. Such subdivision can generally be made without a survey, in the field. The subdivisions may be made by clear and certain descriptions of each subdivision. In the case of large ranchos or other large tracts, a plat and map of the same, showing the subdivisions, with their boundaries, by lots numbered and so described that reference may be made to them. Said plat or map should be made by the owner, and filed in the office of the County Recorder, to which plat, and the subdivisions thereon delineated, the Assessor may refer in describing the subdivision to be assessed. In case the owner neglects, for ten days after demand by the Assessor, to furnish such necessary subdivision, duly described, the Assessor may proceed to have such tract surveyed into subdivisions by the County Surveyor, at the expense of the owner, in the manner provided in Section 3634.

Rule XL. By the provisions of Subdivision 6 of Section 3629 of the Political Code, the Assessor must demand, in all cases, a detailed list of "unsecured solvent credits." Where deduction for "debts due bona fide residents of the State" is claimed, the amount of such debts may be stated in the aggregate. The difference between the sum total of the credits and the aggregate debt is the amount to be assessed.

Rule XLI. It will frequently occur that the Assessor will find personal property in the hands of a party who has become the owner thereof by purchase since twelve o'clock m. of the first Monday of March. Such property cannot be assessed to such purchaser. It can be assessed only to the party who was the owner of the same on the first Monday of March, at twelve o'clock noon. If such party cannot be found it must nevertheless be assessed to him. The tax due on such assessment is not a lien on the personal property assessed, but is a lien on any real property of the owner, from and after twelve o'clock noon, of the first Monday of March. (Vide Section 3717.)

In such cases as the above the Assessor should endeavor as promptly as possible to collect the tax of the former owner. (Vide Sections 3820, 3821, et seq.) For this purpose he is authorized by Section 3821 to seize and sell any personal property owned by such former owner, without regard to the time he became the owner of the same.

WARREN DUTTON, Chairman,
JAMES L. KING,
T. D. HEISKELL,
MOSES M. DREW,
D. M. KENFIELD.

E. W. Maslin, Secretary.

NOTICE TO ASSESSORS.

Office of State Board of Equalization,
Sacramento, April 20, 1880.

We desire to call your attention to that portion of Section 3678, which requires the Assessor to transmit to this Board a statement of all mortgages in his county, which includes lands *in more than one county*, and to Rule XXXI upon the same subject; and to urge as early a compliance therewith as your convenience will permit. Let the statement contain your valuation of the land and improvements.

Also, with regard to mortgages, trust deeds, etc., by which debts are secured upon two or more subdivisions of land, or land assessed in two or more subdivisions, all in your county. We desire to call your especial attention to that part of Section 3678 relating to the subject, and to Rule XXXIII, in relation thereto. The statute is imperative upon this question: "The Assessor shall apportion the amount of assessment to be deducted from each subdivision on account of assessment against said instrument."

As the mortgage or other security must be assessed in the same county where the mortgaged land is situated (Section 3627, Rule XXXIV), and by the same Assessor who assesses the land, there will not be much difficulty in carrying out this complicated law. After fixing the value upon each subdivision of land covered by the same mortgage, if the aggregate value of such subdivision is in excess of the amount which was due on the mortgage on the first Monday of March, the proportion of such amount to be deducted from each subdivision can readily be computed. As an example: Say there are three subdivisions, one valued at $1,000, another at $3,000, and another at $6,000. total, $10,000, all in one mortgage, upon which the amount due is $5,000. The apportionment must be made in proportion to *value*, not *quantity*, of the mortgaged land. The first subdivision would bear a deduction of $\frac{1}{10}$ of the mortgage, or $500; the next, $\frac{3}{10}$ or $1,500; the next, $\frac{6}{10}$ or $3,000.

In case the aggregate value of the several subdivisions is less than the amount due on the mortgage, then of course there is no occasion for computing proportionate deductions, as there will be no surplus value of the land remaining to be assessed.

In assessing the mortgage to the mortgagee or owner, where it covers more than one subdivision, the mortgage must be assessed as a whole, as in other cases, not subdivided into proportionate subdivisions. In assessing a mortgage, the mortgaged lands should be as particularly described in the assessment list and in the assessment book as in assessing the land. The better way is to adopt the same description.

What is said here of a mortgage is equally applicable to a trust deed, or other written contract or obligation by which a debt is secured. The Board fully appreciates the difficult labors and duties of the Assessor in putting the provisions of the new revenue laws in force, not only in the matter of assessing mortgages, but in many other respects. With Rules XXXI, XXXII, XXXIII, XXXIV, XXXVI, and XXXVII, and the latest forms transmitted relating to mortgages, it is believed the Assessors will be successful in making good and valid assessments of mortgages, trust deeds, etc.

By order State Board of Equalization.

WARREN DUTTON, Chairman.

Note.—Special attention is directed to the effect of the amendment of Section 3663, passed April 15, 1880. There is now no exception to the rule of separately assessing franchises, and so entering upon the assessment book or roll.

ANNUAL REPORT

OF THE

STATE ENGINEER

TO THE

GOVERNOR OF THE STATE OF CALIFORNIA,

ON THE

OPERATIONS OF THE STATE ENGINEER DEPARTMENT FOR THE PRECEDING YEAR, WITH APPENDIX.

October, 1880.

REPORT.

Office of State Engineer,
Sacramento, Cal., October 1, 1880.

His Excellency Geo. C. Perkins, *Governor*:

By the Act of the Legislature creating the office of State Engineer I am required to report to your Excellency, on or about October first of each year, the operations of the department for the preceding year, and the extent and nature of the work performed. In compliance therewith this report is submitted.

The Act of March, eighteen hundred and seventy-eight, already referred to, authorized an "investigation of the problems of irrigation of the plains, the condition and capacity of the great drainage lines of the State, and the improvement of the navigation of rivers," and made provision to meet the expense of the work for the two years ending with the month of May, 1880.

By the passage of the "Act to promote drainage," in April, 1880, provision was made for the continuance of the department work connected with the river improvement or drainage problems; and an item in the general appropriation bill for the thirty-second fiscal year—commencing with July, 1880—provided the means for the continuance of the irrigation investigation. The amounts of these appropriations, and items for which disbursed, will be shown in the statement of the Secretary hereunto appended.

THE IRRIGATION INVESTIGATION.

In the irrigation department of the work field operations were suspended before October 1, 1879—the beginning of the period covered by this report—the various parties were disbanded, and a force of assistants were engaged in the office in the task of reducing and compiling the voluminous field notes to a form in which they could be presented to the Legislature.

On the completion of the published report but little field work could be attempted until the beginning of the thirty-second fiscal year (July 1, 1880).

The first appropriation had been for the two years ending May 1, and in making the second appropriation, provision was not thought of to cover the interim of two months between that time and the commencement of the thirty-second fiscal year. This was the more unfortunate, as it lost to the work the two most favorable months for observation on the high water discharge of the rivers of San Joaquin Valley, and deprived the department of the opportunity of collecting much data on the practice of irrigation for the year, which can only be obtained by direct examination in the irrigation districts during the irrigating season.

OPERATIONS IN KERN, TULARE, AND FRESNO COUNTIES.

Preparations were begun, however, to take the field at the earliest practicable moment, and to this end Mr. J. D. Schuyler, Assistant Engineer, was sent in June to Bakersfield, Kern County, to organize Party No. 1.

This party, consisting of six men, was equipped with six pack animals and as many saddle animals, and under the charge of Mr. H. B. Choice, started July 14th for the headwaters of Kern River, to select and survey sites for the storage of waste waters for irrigation.

The object of this work was to ascertain the extent to which the flood waters of the Sierras might be conserved and retained in the mountains for use in drier periods of the year in irrigation of the plains of the great valley.

It has long been conjectured that numerous sites existed throughout the mountains where water could be cheaply stored in unlimited volume. It was made the purpose of this party's work to reduce conjecture to tangible fact, learn the position and capacity of such sites, and acquire the data from which to estimate the volume of waters which it was practicable to store on each of the streams.

After completing the examination of Kern River and its tributaries, the exploration was extended to the headwaters of Tule, Kaweah, and King's Rivers, and the party is now operating on the north fork of the latter stream, but will soon be forced to withdraw from the mountains, on account of the heavy snows. The difficulties of carrying on an examination of this character, in a country so little known, and of which a large portion has scarcely been explored, needs but to be mentioned to be appreciated. Progress has necessarily been slow, but a large territory has been very thoroughly examined, and the results have been generally satisfactory. Nine reservoir sites were surveyed in the Kern River watershed (covering fifty to five thousand acres each), one on Tule River, three on the Kaweah, and seven on King's River.

OPERATIONS IN LOS ANGELES AND SAN BERNARDINO COUNTIES.

After organizing Party No. 1, Mr. Schuyler proceeded to Los Angeles County, where he organized Party No. 2, which was placed in the field, on August 5, in charge of Mr. H. J. Stevenson. The party consisted of one transitman, one leveler, one rodman, two chainmen, one axman, and a cook, and was provided with a team and spring wagon, for transportation. To this party was assigned the duty of running out high grade canal lines from some of the principal streams of Los Angeles County, connecting them with reservoir sites in the outstanding hills, which were located and surveyed in the most favorable places, the object being to ascertain the extent of irrigable land and the facilities for irrigating it.

Party No. 3 was organized in San Bernardino, and placed in the field, August 13, in charge of Mr. F. T. Perris. It consisted of five members, and was provided with a four-horse team, for transportation. The work assigned to it was similar to that of Party No. 2, consisting chiefly in the survey of sites for storage reservoirs in the mountains and foothills of San Bernardino, and the southern part of Los Angeles County. The party will disband, October 31, after quite a thorough examination of the field chosen. Up to this time the Los Angeles and San Bernardino parties have surveyed twenty-three reservoir sites, and run about two hundred miles of canal grade and reconnoissance lines.

MOUNTAIN RECONNOISSANCES.

While this work was in progress. the Assistant Engineer in immediate general charge of the Irrigation field investigation, devoted a large share of his time to a reconnoissance of the mountains of Los Angeles and San Bernardino Counties, for the purpose of determining the feasibility or otherwise of storing therein any portion of the surplus water of the Winter supply. Each of the principal streams were explored from the mouth of their cañons to the summit of the range from which they were derived, and thus a more definite idea has been obtained of their characters throughout.

STUDY OF THE SOILS IN IRRIGATION REGIONS.

Much attention has been devoted during the past season to an examination and classification of the soils in the irrigation districts of Fresno, Tulare, Los Angeles, and San Bernardino Counties. There have been, from time to time, nine of the local engineers and surveyors most familiar with the county, engaged upon this work, and it has been carried on in detail, section by section, and township by township.

The general boundaries of the various classes of soil have been outlined upon plats of large scale, and the topography of existing maps has been corrected by direct reconnoissance upon the ground. The character of the soil and subsoil with reference to their adaptability to irrigation has been studied, together with the practice, results, and extent of irrigation throughout the districts examined. This examination has thus far extended over forty-nine townships, embracing considerably over one million acres of land, and is still being carried on with a reduced force.

COMPLETION OF WORK FOR THE SEASON.

After the disbanding of Party No. 2, a small boring party will be organized to conduct borings in the beds of certain streams of Los Angeles County, with the object of ascertaining the depth at which an impervious substratum might be found as a foundation for submerged dams for raising the underflow of water to the surface, and thus rendering it available for irrigation.

Another small gauging party will be placed in the field to gauge the low water discharge of all streams and canals or ditches in the irrigation regions of Los Angeles and San Bernardino Counties, as a study of the extent of the water supply, and of its use in irrigation, to go with similar studies heretofore made.

By the last of November all surveying and other parties will have been disbanded, and the labor of working up in the office the results of field operations for the season will have commenced.

JOINT WORK WITH THE U. S. ENGINEERS.

By authority of Congress, and under the direction of the Secretary of War, through the Chief of Engineers of the U. S. Army, Colonel G. H. Mendell of the Engineer Corps, stationed in San Francisco, has had surveys made in considerable detail of the American, Cosumnes, Mokelumne, Calaveras, Stanislaus, and Tuolumne Rivers, and some intermediate creeks, from their respective cañons out into the plains; in each instance for fifteen to twenty-five miles in length.

These surveys were made more especially with the view of studying the subject of the storage of mining detritus, upon which Congress desired an official report; and according to an understanding between myself and the Engineer in charge, copies of the results of his work are to be exchanged for copies of the results of the work of this department made in the rivers further north.

This will afford the data also for a study of the diversion of water from these rivers for purposes of irrigation. So that the State Engineer Department will soon be possessed of valuable information upon the engineering phase of the irrigation problems in Sacramento, San Joaquin, Stanislaus, and Merced Counties. And, taking these surveys as a basis, the investigation will be carried forward in the counties mentioned during the ensuing Spring and Summer. The fact that surveys of the above named rivers were to be executed by the United States Engineers, accounts for this department not having commenced operations in the counties mentioned during the past season.

THE DRAINAGE WORK.

By the passage of the "Act to promote drainage" a new line of duty was imposed upon the State Engineer. Theretofore, his operations were solely of a preliminary nature—*investigations* made with the view of finding out the possibilities in the several problems into which he was called upon to examine.

The drainage Act contemplated the construction of works to improve the water-carrying capacity and navigable qualities of the main and tributary streams. In the view of the case taken by the Legislature, it was made necessary by the results of the operations of hydraulic mining. The holding back of so much of the mining detritus as can be stored is a necessary adjunct to the drainage work proper; and the improvement of the river channels—the real work of drainage—is necessary to be done before the low lands can be reclaimed, the towns and cities of the alluvial districts protected from inundation, and the navigation of the streams maintained.

The law requires the State Engineer to report concerning the formation of drainage districts, to prepare plans and specifications for the works, after districts are organized, and to supervise the constructions undertaken. As has been observed, this is a line of duty distinct from that contemplated by the original Act organizing the State Engineer Department, and it is in this chiefly that the drainage work of the department has been conducted during the season since May of the present year.

DRAINAGE DISTRICT NUMBER ONE.

Under the drainage Act, a district for the Sacramento Valley was formed in May, 1880, which was called Drainage District No. 1.

The proceedings attending the formation of this district, and the record of the duty performed by the State Engineer in connection therewith, have been laid before you, and published in pamphlet form.

I now submit a statement of the work subsequently performed by myself and assistants in the matter of drainage.

Preliminarily, it is to be understood that the work of the State Engineer Department, under the drainage Act, except as to the matter of general supervision or inspection of works on the part of the State Engineer, is confined to projecting or planning works.

Under the law, the Directors of the drainage district have the services of a Resident Engineer who takes active charge of construction and measurement of work in the field after the projects for the same have been made by the State Engineer.

Owing to the great haste in which it has been necessary this year to prepare work so as to be in time to take advantage of the season when it could be performed, the duties of the State Engineer's force, and that of the Resident Engineer of the drainage district formed, have not been so clearly defined and adhered to, as they probably should be, so that it is difficult to report in brief the work of this department without perhaps including something done under the direction of the Resident Engineer, or leaving out something done under my own immediate supervision.

Thus, the same field parties have been transferred from one department to the other during the season, or the organization broken up and divided, and sometimes for limited periods, and from motives of economy and convenience, one party has been performing duties simultaneously, properly in part belonging to both departments.

Operations have been carried forward under many difficulties, not the least of which has been the unhealthfulness of the localities in which the parties had to work and camp. Frequent severe attacks of malarial fevers and other ailments have resulted to the employés. Not a party has escaped; but few individuals have gone through the season without an attack compelling cessation of work for several weeks; some have been seriously ill, and one death has occurred.

FIELD WORK.

Party No. 1.—This party was organized during the latter part of July, and commenced work on the first of August. It was quartered in one of the arks belonging to the department, and was furnished with tents, team, and wagon, for operations not convenient to the river. The outfit consisted of such instruments as were needed for accurate and thorough mapping, and for locating works. Its membership was as follows: One Assistant Engineer in charge, one plane tabler, one leveler, one to two rodmen, two chainmen, one flagman, one to six axmen, one driver, one cook.

During August it was engaged in making detailed examinations and surveys on the upper Sacramento River from Chico Landing to Riley's cut-off, a distance of about twenty miles. All levees, old river channels, and the hard-pan banks standing back from the river, were carefully mapped. This work extended over an area of more than thirty square miles. From the thirtieth of August to the tenth of September the party was disbanded from sickness of its members. During the remainder of September Party No. 1 was engaged in examinations from Chico Creek to Butte Slough.

Party No. 2.—This party was organized on June 24, having been previously engaged in the survey of portions of the boundary lines of Drainage District No. 1. It was occupied from June 24 to July 1 in surveys on the left bank of American River, near Brighton, and on July 1 was transferred to the vicinity of Marysville, and has been occupied to date in making special surveys of portions of Feather and Yuba and Bear Rivers, in locating dams, levees, and channel lines on these streams.

Later it is to make careful plane-table surveys of the reservoir spaces back of the dams, and to cross-section these spaces, to determine, by future comparisons, the exact effect of these dams in storing mining detritus.

The party varied in strength according to the requirements of the work. Its general organization was as follows: One Assistant Engineer, in charge as transitman or plane-tabler; one Assistant Engineer, as plane-tabler; one to two levelers, three to four rodmen, two chainmen, one to four axmen, one driver, one cook.

The outfit comprised complete instruments for the work assigned, with draughting instruments and materials; two wagons and teams when necessary, and one at all times. During the latter part of the time it was furnished with tents. The health of this party was generally better than that of Party No. 1, although there were a number of cases of malarial fever of a severe type.

Party No. 3.—This party was organized during the latter part of July, and was engaged for about three weeks in making special examinations of portions of Sacramento River, from Knight's Landing to Sacramento City—particularly at the various crevasses on the west bank—and in similar examinations of the lower portion of American River. It was quartered in one of the arks in use by this department for the past two seasons, and was furnished and equipped for the character of work to which it was assigned. Its membership was as follows: One Assistant Engineer, in charge; one transitman and leveler, one rodman, two chainmen, one axman, one flagman, one cook.

This party was transferred to Drainage District No. 1, on the thirteenth of August, the Assistant Engineer having been chosen by the Board of Directors of that district as their Resident Engineer.

Messrs. M. Manson, C. E. Grunsky, and A. Boschke have been my assistants, in charge of field work of the Drainage Department.

OFFICE WORK.

During the past year the office work of the department has been more important than formerly.

It has included the preparation of the report made to the Legislature in January; the report made on the formation of Drainage District No. 1; two extended reports to the Directors of the Drainage District; a schedule of works for the Drainage District, together with estimates, plans, maps, etc.

Plans and specifications for the drainage work were prepared as follows:

1. For a dam upon the Yuba River.
2. For a dam upon the Bear River.

3. For levees and brush work on the Yuba and Bear Rivers.
4. For channel improvements on Feather River.
5. For bank building on the Feather River.
6. For bank building and leveeing on the upper Sacramento River.
7. For bank building and channel improvements on the lower Sacramento River.
8. For closure of crevasses on the west bank of Sacramento River near the American River.
9. For bank building on the east side of the Sacramento River, just below the City of Sacramento.
10. For bank building and protection on the American River, near Sacramento.

The specifications explain the nature, extent, and intent of these works, and their general relation to the plan of operations is apparent from the reports made to the Board of Directors.

GENERAL MAP OF THE STATE.

An important labor in the office during the past year has been the projection and partial completion of a map of the entire State. In my work of studying the drainage system, map making for Drainage District No. 1, studying the water supply drainage areas for irrigation, and the outlining of irrigation districts, the necessity for a reliable general map as a key, and detail maps on an uniform scale and method of projection, was felt, and had to be supplied in a measure for a large portion of the State. This led to the projection of a map of the entire State, for the parts could not be correctly worked in, except upon a projection of the whole.

Realizing that the result of this work could not fail to be of great interest to the citizens of the State at large—seeing that there is absolutely no map of the State at all complete or correct—I have pushed this work forward, and now have it well under way. The State map is drawn to a scale of six miles to the inch, and will occupy a sheet about ten feet square. It is laid down on what is technically known as the polyconic projection, and the greatest care has been taken to make this formation with mathematical accuracy. The astronomical and geodetic work of the United States Coast and Geodetic Survey, the United States Geographical Surveys, and the State boundary surveys, have been used as the basis for this map.

Detail information has been collected from all Government and State surveys, private surveys, and the work of this department. No pains will be spared to make this a complete and useful work, and I respectfully represent that it may well be published as fast as completed, at State expense, and sold at cost price for the benefit of her citizens and the public generally.

CONSULTING ENGINEER.

In July of the present year Mr. James B. Eads, C. E., of St. Louis, Mo., joined Col. Mendell and myself, at your request, as Consulting Engineer on the drainage problems; together we viewed the principal portion of the field of operations in the drainage district formed, and examined the data collected by surveys and examinations theretofore made. I take pleasure in acknowledging the courteous and willing assistance rendered me in consultation by both of these gentlemen mentioned, and refer with pride to the fact that my projects have been in all essential main points indorsed by them.

CONCLUSION.

I shall, as the law requires, report more in detail to the Legislature in January, 1881, and hence refrain from incumbering this statement of operations for the past year with discussions of plans or statements of results, which, as yet, are really not in proper condition to be referred to.

Appended hereto you will find a financial statement from the Secretary, Gen. G. B. Cosby, accounting for his disbursements for the work. I also ask your attention to a memorandum of the subject of Irrigation, which will accompany this report.

Very respectfully, your obedient servant,

WM. HAM. HALL,
State Engineer.

Statement of Amount and Classification of Expenditures of State Engineer Department, from October 1, 1879, *to May* 1, 1880.

For What Purpose.	Amount.
Paid for salaries and services	$12,998 45
Paid for material	47 29
Paid for tools and implements	38 05
Paid for repairs, alteration, and construction	117 65
Paid for traveling expenses and subsistence	596 95
Paid for stationery	48 14
Paid for services by petty cash	292 75
Paid for freight and expressage	168 75
Paid for telegrams and postage	133 69
Paid for miscellaneous expenses	403 60
Paid for provisions	127 00
Paid for fuel	5 00
Paid for forage	133 63
Paid for office supplies, furniture, etc.	59 43
Total expended	$15,170 38

Sacramento, October 10, 1880.

Wm. Ham. Hall, State Engineer:

Sir: I submit the above as a correct statement of the amount and classification of the expenditures of the State Engineer's Department, from October 1, 1879, to May 1, 1880.

Very respectfully,

G. B. COSBY,
Secretary State Engineer.

Statement of Amount and Classification of Expenditures of State Engineer Department to October 10, 1880, on account of Irrigation Surveys.

FOR WHAT PURPOSE.	Amount.
Paid for salaries and services	$5,799 55
Paid for live stock	269 00
Paid for instruments	274 68
Paid for tools and implements	6 50
Paid for material	14 48
Paid for repairs, alteration, and construction	120 90
Paid for stationery	73 75
Paid for services by petty cash	32 74
Paid for traveling expenses and subsistence	437 75
Paid for freight and expressage	6 35
Paid for telegrams and postage	32 30
Paid for miscellaneous expenses	160 35
Paid for provisions	807 43
Paid for forage	189 70
Paid for office supplies	18 05
Total expenditures	$8,243 53

SACRAMENTO, October 10, 1880.

Wm. H. Hall, State Engineer:

SIR: I submit the above as a correct statement of amount and classification of expenditures of the State Engineer Department, on account of irrigation surveys, to date.

Very respectfully,
GEO. B. COSBY,
Secretary State Engineer.

Statement of Amount and Classification of Expenditures of State Engineer Department, on account of Drainage Work, for the term from May 1 *to October,* 1880—*approved by Board of Directors Drainage District No.* 1.

For What Purpose.	Amount.
Paid for salaries and services	$11,383 24
Paid for provisions and subsistence	1,075 78
Paid for services by petty cash	86 10
Paid for material	50 71
Paid for traveling expenses and subsistence	561 40
Paid for repairs and construction	179 33
Paid for stationery	325 85
Paid for instruments	316 00
Paid for teaming outfit	34 00
Paid for forage	176 59
Paid for tools and implements	109 33
Paid for cook's outfit	34 65
Paid for freight and expressage	90 10
Paid for miscellaneous expenses	297 83
Paid for telegrams and postage	45 70
Paid for fuel	4 50
Total	$14,771 11

Sacramento, October 10, 1880.

Wm. H. Hall, State Engineer:

Sir: I submit the above as a correct statement of expenditures of State Engineer Department, on account of drainage surveys.

Very respectfully,

G. B. COSBY,

Secretary State Engineer.

THE IRRIGATION QUESTION IN CALIFORNIA.

APPENDIX

TO THE

REPORT OF THE STATE ENGINEER,

TO

HIS EXCELLENCY, GEORGE C. PERKINS,
Governor of California,

BY

WM. HAM. HALL,
State Engineer.

October, 1880.

MEMORANDUM.

THE IRRIGATION QUESTION IN CALIFORNIA.

His Excellency GEORGE C. PERKINS, *Governor of California:*

SIR: I respectfully call your attention to the subject of Irrigation—the condition of the Irrigation interest in the State—believing it to be one worthy of your special consideration at this time.

In a report made to the Legislature in January, eighteen hundred and eighty, I endeavored to set forth the condition of the Irrigation interest in California, to point out the abuses and complications which have grown up under the present laws, and show how much the progress of irrigation enterprise is embarrassed by reason of their existence.

Conflicting Interests.

Conflicts of interest, for whose adjustment the present laws afford no adequate method, keep matters connected with water rights for irrigation in such an unsettled condition that there is no basis of credit upon which to raise money for the construction of irrigation works, and no certainty in farming with irrigation, except in cases where all rights can be monopolized or brought under one control, and these instances are few.

Two general classes of conflicts have made themselves known throughout the counties where irrigation is now practiced, namely:

(1.) Conflicts between rival appropriators of water, or claimants by prescription; and,

(2.) Conflicts between appropriators, or claimants by prescription, and riparian owners.

Of course there are an infinite number of sub-varieties of cases which come up under each of the general classes.

In the San Joaquin Valley, not only are these conflicting interests present, but another element will soon make its appearance (indeed it has already), and we will have inevitably, unless the State controls and directs the diversion of waters from the San Joaquin River and its tributaries;

(3.) The worst conflict of all, namely: that between the appropriators of waters for irrigation, and the navigation interests on the main river.

Proposed Settlement of Conflicts.

The question is, how to do away with this clashing of interests.

To settle conflicts between appropriators or claimants by prescription, it has been proposed—and I find the plan advocated by many worthy people, in the irrigation regions—that the State take charge of the whole matter of irrigation—condemn and pay for all existing rights to water, for the public benefit, construct the works of irrigation, and sell the water.

As a variation to this, others advocate an apportionment of the waters, after being condemned for the public good, and paid for by the State, to the lands requiring them.

And again, other people would have all water rights condemned, but paid for by the lands to be benefited in each instance.

I do not think any such plan is feasible, and for the following reasons:

First—The outlay for the satisfaction of existing water claims would necessarily be so great that the State could not be brought to undertake the settlement.

Second—If the State should undertake the construction of irrigation canals, or works of irrigation proper, her enterprise would fail of success, and involve her in enormous expenditures of money.

(See Chapter V, of Part IV, Report of State Engineer, January, 1880.)

Third—If the State should reapportion the waters, the supply would not be sufficient for all, and the conflict would be as great as ever.

Fourth—The conflict between users of water for irrigation and claimants under the riparian principle would still exist, and could not be done away with by condemnation—for the field is immeasurably too great.

Fifth—The conflict between users of water for irrigation and the navigation interests would still exist, and it is altogether impracticable to condemn the right of navigating a public stream.

Riparians vs. Appropriators.

It has been proposed to limit the rights of riparian proprietors to water privileges for the use of stock and domestic purposes. While I heartily concur in this as a correct—in fact, the only admissible—definition of a riparian right in an irrigation country, I see very clearly how the State, by making this simple declaration and doing no more, will strike a blow at one (the riparian) class of interests, without clearing up the horizon for the other (the appropriation) class, and without doing anything for by far the largest class—those who have dry lands but no water claim at all.

The appropriators of water have done just what the law permitted them to do. Some few appropriators of water for irrigation have built good works, prepared their lands properly for irrigation, and are really public benefactors—for they have brought health and plenty where formerly ague and poverty, or widespread desolation, reigned. They have, as a class, however, set up extravagant claims to water, have done little to make these claims good, and now hold them to the detriment of the people at large, not being able to organize, and economize the waters themselves, and permitting no one else to do it, because they fear to have adverse claims grow up. I repeat, it is quite natural that this should have been done. In fact, it is the only way by which rights to water could be held at all, and we would all do it if we could. But I doubt the propriety of the State attempting to limit one class of interests—the riparian—which, to say the least, is represented by the majority of people in the State who have any direct interest at all in the matter—for the benefit exclusively of another class—a small minority of her citizens—whom she has already permitted to acquire valuable, or what would then be exceedingly valuable privileges, by appropriating the waters of her streams, without at the same time taking steps to insure to the class restricted the rights which she does accord them.

The riparian principle carried out upon the English common law rule should not be maintained in California. She never can be a truly great agricultural State without irrigation, and she should set that dog-in-the-manger principle aside, for a system which will insure a respect of all rights as far as can be, and accomplish the greatest good to the greatest number, by the use of the water in irrigation, as far as it can be, after satisfying the just demands of riparian proprietors by some means economical of the water supply, and at such seasons as will not materially interfere with navigation interests.

The Proposed Remedy.

You will see from this about what I would propose as the solution of the irrigation question, namely: That the State shall direct and control the diversion of waters from the streams; insist upon its economical use; see that riparian proprietors are supplied with water for stock and domestic purposes, at least, if they cannot all come in for a share of the water for irrigation; see that all lands naturally dependent upon a public source of supply get their share, as far as the supply will go, upon some reasonable terms; and see that sufficient water is left in navigable streams to satisfy the interests of commerce, at stated seasons, when most needed.

This the State can do by virtue of her police authority, and in my humble judgment she will be obliged to do it some day, and the sooner it is done the better for all concerned.

Before, however, she can exercise this authority, she must know definitely what interests she has to deal with—what water rights have accrued, and what is the nature of them—and there must be some general State plan of organization under which irrigation is to be carried on. There can be no satisfactory regulation of rights altogether undefined, and no settled condition of affairs until the irrigation interest is placed on a good business footing by a definition of present rights and an organization for future operations.

Hence, I propose that the State shall:

First—By the passage of a law entitled "An Act to define and regulate water rights:"

(1.) Institute proceedings to define for record the extent and nature of all existing water privileges.

(2.) Provide for a proper record of existing rights to water, and for the annual correction of the same to date.

(3.) Provide for the issue of water privileges in proportion to the supply of water in each stream, and designate by schedule the extent and order of each claim.

(4.) Supervise in a general way the distribution of water from the streams or natural sources of supply, to those holding water privileges.

(5.) Establish a definite standard of measure for water used for agricultural and mining purposes, and prescribe the form and dimensions of measuring apparatus to be employed in dealing out water under different circumstances.

Second—By the passage of a law entitled "An Act to promote irrigation:"

(1.) Provide for the organization of irrigation districts, from time to time, according to the natural divisions of the land, as near as may be, in each instance.

(2.) Provide for the internal self-government of each such district by the residents thereof.

(3.) Provide for the allotment of permanent water privileges to such districts.

(4.) Provide for the condemnation of private water rights for the public use, in the case of rights acquired to waters from public streams for lands within such districts.

(5.) Provide for the adjustment of riparian rights in each instance where a water privilege is granted to a regularly organized district, so that the riparian proprietors will be insured sufficient water for domestic and stock purposes, the district be held liable for its share of the expense of meeting this obligation, and the State undertake the adjustment.

(6.) Provide for the protection of river navigation by regulating the diversion of water from navigable rivers and their tributaries, so that in some certain periods the waters may be used for irrigation, and in some other periods they shall be allowed to flow in the streams for the benefit of commerce.

(9.) Provide for the total extinguishment of rights by condemnation, where unadjustable conflicts occur.

(10.) Carry on such observations as will detect the locality and cause of waste or loss of water in each instance; conduct experiments with the view of discovering the most economical means of distributing and using water in irrigation without material loss or waste.

(11.) Establish general regulations, from time to time, for the distribution of water in irrigation, which will prevent waste, insure good drainage, and guard against the unhealthful tendency of the careless and vicious use of water in irrigation.

Important Points.

In framing these laws it must be kept in view that the sources of water supply vary in character, and that the nature of rights vary not only with the sources, but in themselves also.

Thus we may have sources of water supply of the following kinds:

- (a) Public streams:
  - The living waters of—
    - Navigable.
    - Tributaries of navigable.
    - Non-navigable.
  - The stored waters of—
    - Stored at private expense.
    - Stored at public expense.
- (b) Private streams:
  - The living waters of—
    - To the extent of private claims.
  - The stored waters of—
    - Stored at private expense.
    - Stored at public expense.
- (c) Natural springs:
  - Having sources above all appropriation.
  - Having sources to be affected by higher appropriation.
- (d) Artificial wells:
  - Artesian wells.
  - Pump wells.
- (e) Waste water from irrigation canals.
- (f) Waste water from irrigated fields.
- (g) Waste water from drainage of moist land.

Claims to water have grown up from:

(a) Simple appropriation and use.
(b) Filing notice, and appropriation under the mining laws.
(c) Filing notices, and appropriations under the Codes.
(d) Appropriations under the Desert land law.
(e) Obtaining privileges from County Water Commissioners.
(f) Through Spanish pueblo privileges.
(g) By ownership of the course, and the natural source of supply.
(h) By ownership of the bed of the stream.
(i) By ownership of the bank of the stream.
(j) By the construction of private wells.
(k) By the storage of waste waters.

What may be Expected.

It is not to be expected that any law or laws can be framed at once which will settle the many conflicts of interest that arise out of these diverse interests and conditions. Without doubt many questions must for all time go to the Courts. But it is certainly possible to put irrigation upon a far better basis than it is now, and at the same time give the Courts some better guide in the execution of their duty than they have now. Certainly, the whole question can be simplified in the manner I propose, and I must confess that after much thought I see no other way how it can be accomplished.

If the matter goes on as it is, it will result, in settling the disputes between rival claimants, in the monopoly of all good water privileges by a few individuals, who will have water to sell under claims acquired without regulation, in the waste of water by reason of works constructed without system and used without proper supervision, and in many instances in the production of unhealthful neighborhoods by unskilled and unrestricted use of water.

And in the settling of disputes between appropriators and riparian proprietors on all streams of short supply, the appropriator will probably go to the wall, and water which might be made, under a proper organization, to irrigate thousands of acres of land, will be allowed to waste in the dry sandy beds of streams and the pools of swamps, to effect some little natural irrigation below, or water a few head of live stock.

The conflict between water appropriation for irrigation and the navigation interest of streams below, cannot be settled but by the intervention of State regulation as indicated.

Effect of the Proposed Plan.

The plan which I have outlined contemplates:

(1.) State regulation of the public sources of supply, the streams, and of waters allotted to claimants from those sources.

(2.) District or private regulation, under general State laws, of the details of distribution from the canals to the irrigators.

(3.) State regulation of the use of water in irrigation—to the end that none be wasted.

(4.) State adjustment of conflicting rights by arbitration, as it were, when possible, or by condemnation where necessary and possible.

When this much has been accomplished there will then be a good basis of credit in irrigation property. Capital can be obtained for the construction of irrigation works, on the credit of a district, whenever it is known that there attaches to the lands thereof, from the State, a good and sufficient water right for their irrigation.

For instance, a district embracing thirty thousand acres of land has a water right. The lands are worth, dry, five dollars per acre. It will cost ten dollars per acre to completely irrigate them. The district says to capital, construct our works according to prearranged State plans and specifications. We, the district, taken as a whole, will pay for this in fifty annual installments, principal and interest, the money to be raised by taxation on the whole property of the district, under the State law, and, at the end of fifty years, take the works off your hands. In the meantime, revenue for the maintenance and administration of the works, to be raised from the sale of water to actual irrigators, at prices within limits to be prearranged.

By this plan, good works would be constructed cheaply. The capital becomes a contractor to build works. The State supervises their construction. The interests of the district are protected. Capital has a good security, because there is a good water right attached to the land, and the State is the arbiter between parties to the transaction, by her general law properly administered.

The working of the plan would not be an attack on any class of interests. The appropriators would have their rights definitely determined by a procedure in which they would be called upon to prove up their claims according to the measurements and statistics of the State, made and collected by her Engineer Department. They would not be put to any considerable expense; they would be relieved, in many instances, from future litigation and expense, by having the facts affecting their claims, and all rival claims, made of record, definitely, at once, and there would be no impediment put in the way of continued acquirement of right to the use of water under moderate and wholesome regulations.

Riparian proprietors would be assured their privileges as far as possible, and would be protected from the effects of the unregulated appropriation which they now fear.

The people of the State would be benefited by an assurance, on the part of the State, that the waters would be used to the best advantage for the greatest number of those requiring them.

I shall call the attention of the Legislature, at the approaching session, to this matter, and submit a more definite plan than here outlined, for the consideration of its members.

In conclusion, permit me to observe that, in my opinion, by effecting the object aimed at herein—the settling of water right disputes, the conservation and extension of the water supply for irrigation—the State will have only done simple justice to the residents of the largest portion of her territory, and will have practically increased her wealth many fold.

Very respectfully, your obedient servant,

WM. HAM. HALL,
State Engineer.

Sacramento, October, 1880.

REPORT

OF THE

STATE ENGINEER

TO THE

Legislature of the State of California--Session of 1881.

Part I.

History of Operations of the Department.

SACRAMENTO:
STATE OFFICE : : : J. D. YOUNG, SUPT. STATE PRINTING.
1881.

INTRODUCTORY LETTER.

Office of the State Engineer,
Sacramento, January 3, 1880.

To the honorable Senate and Assembly of the State of California:

By the Act of Legislature approved March 23, 1878, creating the office, the State Engineer is required to report to the Legislature concerning the operation and work of his department during the period of time since the preceding session. In compliance with this instruction, the present report is made for the year 1880.

The Act of March, 1878, already referred to, authorized an "investigation of the problems of irrigation of the plains, the condition and capacity of the great drainage lines of the State, and the improvement of the navigation of rivers," and made an appropriation to meet the expense of the examinations for the two years ending with the month of May, 1880.

By the passage of the "Act to promote drainage" in April, 1880, provision was made for the department expenses connected with the drainage, or river improvement, and *debris* works; and an item in the general appropriation bill for the thirty-second fiscal year, commencing with July, 1880, provided the means for the continuance of the irrigation investigation.

The work of the State Engineer Department for the first two years of its existence was altogether in the nature of an investigation, or inquiry, into the irrigation and the drainage questions, and, incidentally, into the so called *debris problem.* Since the expiration of that period, the irrigation investigation has been continued, but the drainage duty has been of a different character—designing and supervising the construction of works. The irrigation investigation, then, during the present fiscal year has been carried forward under the original Act of 1878, and with the appropriation made by the last Legislature, while the drainage work has been prosecuted under the *Act to promote drainage,* and with funds furnished through the Board of Directors of *Drainage* District No. 1, from the State Drainage Construction Fund. The amounts of these appropriations, and the items for which disbursed, will be shown in the statement of the Secretary, which will be appended to this report.

The Act to promote drainage does not require a report from the State Engineer to the Legislature, and the drainage work of his department has been carried on since the last report under that Act; nevertheless, I shall submit a report on the subject. The irrigation investigation was not renewed until the appropriation became available in July of 1880, and the time since that date has been too limited in which to consider the results of the field investigation made during the present fiscal year, and report upon them as I should like to. I shall, however, submit a paper on this subject of irrigation also, and thus my report will be complete in its parts, after the pattern of that submitted in January, 1880, although it will not be as full as to matters of detail, nor so voluminous in its description of the field of inquiry.

It is this year naturally grouped under four general headings, as follows:

A history of the operations of the department;

An account of the drainage works;

An account of the result of the irrigation investigation;

And a statement of the present condition of the work of the department.

In my former report to the Legislature, the *debris* investigation was reported upon separately from that of drainage. The subsequent legislation very properly linked these two subjects together in one, and now, to preserve uniformity in the reports, I shall treat them both in one part of the report, with the understanding that it is Parts II and III in one.

Very respectfully, your obedient servant,

WM. HAM. HALL,
State Engineer.

OUTLINE OF SUBJECTS REPORTED UPON.

Part I. History of operations of the State Engineer Department.
Part II and III. The drainage (and *debris*) works.
Part IV. The irrigation question.
Part V. The present condition of the inquiry.

PART I.

HISTORY OF THE OPERATION OF THE STATE ENGINEER DEPARTMENT.

The objects, character, extent, and manner of performance of the investigation conducted, and other preliminary work performed by this department, will be set forth in this part of the report.

PARTS II AND III (IN ONE).

THE DRAINAGE (AND DEBRIS) WORKS.

A description of the works projected for impounding the detritus, the rectification of river channels, and, generally, the promotion of drainage, within the boundaries of Drainage District No. 1, the Sacramento Valley, together with an account of the formation of the district, and of the works projected therefor, will be given in this double part of the report.

PART IV.

THE IRRIGATION QUESTION.

A discussion of the irrigation question as one to be dealt with by the Legislature, embodying suggestions for a practical treatment of it, together with the draft of several bills, to serve as a foundation for legislation, will be submitted in this part of the report.

PART V.

PRESENT CONDITION OF THE INQUIRY.

What has been done thus far will be briefly reviewed, and what it is proposed to do in the future will be submitted in this part of the report, together with the financial statements of the department.

PART I.

HISTORY OF THE OPERATIONS OF THE DEPARTMENT.

To the honorable Senate and Assembly of the State of California:

The work of the State Engineer Department has not been conducted under the most advantageous circumstances during the period since the former report was made to the Legislature. Owing to the uncertainty which existed throughout last Winter as to whether or not provision would be made for the continuation of the department work, it was not deemed advisable to keep up the observations in the field and collect data which might never be used; but considerations of prudence prompted the expenditure of the small remaining part of the fund available, in arranging the information and studying the partial results, already attained, in order that as much benefit might be derived from the one appropriation as possible. Thus the season was altogether lost for observation on the streams in the line of the drainage investigation, and the collection of data (except to a very limited and unsatisfactory extent, as hereafter mentioned) for the study of the subject of supply for irrigation. Although the continuation of these observations was afterwards sanctioned by the Legislature, the funds made available for the purpose were not to be drawn upon until July, thereby leaving a space of two months, May and June, between the expiration of the period for which the first appropriation was made and the time when the second could be used. So that in reality the season, or the valuable part of it for the work which has been delegated to me so far as preliminary observation and study is concerned, has been in a great measure lost.

The above remarks are applicable more especially to the circumstances attending the irrigation branch of the department work, and are offered in partial explanation of the change in the character of the work which has been of necessity made, and by way of accounting for the paucity of results as to deductions from field work which I will be enabled to present to you in this report. In the drainage branch of work, as already remarked, no observations were made last Winter, because it was not known whether they would ever be used—the results would have been obtained with the last of the money on hand, and there might not have been any provision made for the utilization of them. As it was, the passage of the Act to promote drainage enabled the State Engineer to project plans for the improvements contemplated by it for the year and the immediate future, but it has not put at his disposal the means for a continuation of the study of the general problems involved; and it was fortunate that the preliminary investigation work was closed up as far as it had progressed with the remains of the original appropriation, for the results made available have been valuable as data for the practical study of the probable effects of works now in contemplation or already in progress.

In a letter introductory to this entire report, and made a part of it, will be found a statement of the exact circumstances in which this department has been placed under the several Acts of Legislature, during the past season, and I respectfully refer to this for any explanation further than that here given, which may be desired.

OBJECTS AND WORK OF THE DEPARTMENT.

In the matter of preliminary investigation, the objects and work of the department were explained in the former report already referred to, and for convenience of reference the explanation is reproduced here, without any apology for the repetition, other than that it is well to keep in view the necessity for, and the true purposes of this work, and I cannot more clearly or concisely state them than was done in the paragraphs which follow.

The object of this work, as held in view during its progress thus far under the instructions contained in the law, have been as follows:

First—The solution of the problems of drainage presented in the great valleys of the State, so that upon general plans thus formed, all works undertaken for river improvements and reclamation of lands, may form a part of one harmonious whole, and thus contribute towards the final accomplishment of the ultimate object—the prevention of widespread inundations and the improvement of the navigation of the rivers.

Second—The solution of the "debris problem," so called, in order that means may be suggested whereby agricultural lands shall be protected from the flow of mining detritus, and that the rivers through the valleys be relieved from the burden of sediment which is now brought into them by the streams from the mining regions, without radical interference with mining interests.

Third—The solution of the irrigation problems, in order that the greatest good may accrue to the greatest number of citizens through the use of the waters of the streams of the State in irrigation.

THE PROBLEM OF DRAINAGE.

To perfect the rapid drainage of a valley, is to prevent the uncontrolled inundation of its plains. Nature rarely presents a highly fertile land whose drainage is other than very defective. A perfect system of drainage is as much a work of art as is an unobjectionable system of sewerage in a large city.

Sewerage works are constructed in the infancy of great towns without system, without art. Long afterwards, when, as the result of defective sewerage works, death and disaster have reaped an undue harvest, a struggle is made for systematization.

So, in the early settlement of every valley, the interdependence of works affecting its drainage is overlooked as much as the intimate relations of the parts of a sewerage system at first is.

The farmer who builds a levee along the river in front of his property, fails to see the effect which that particular embankment may have upon the general system of drainage in this valley, as the city property owner, who in early times constructed a large wooden sewer on a steep grade, to enter a small pipe sewer on a gentle slope, failed to perceive how that work might affect others.

A levee on a river is but a side of a drain which forms a part of a system more complicated in its parts, subjected to more complex and far more powerful influences, than any sewerage works can ever be.

Though all works necessary to effect the complete and rapid drainage of a great valley contribute directly to prevent overflow of its alluvial plains, there is always much to be done in accomplishing this end, which is not designed directly for the protection of any particular part of these lands; thus, while an embankment will possibly keep the water off from one piece of property, the removal of a bar in the river, or other rectification of the channel in front of that embankment, may so facilitate rapid drainage as to prevent the overflow of many tracts along the river, far above.

While the construction of a levee may not be essential to render the property immediately behind it cultivable, because the waters which escape at that point run away quickly, the absence of that embankment may render thousands of acres, situated far down the valley, desolate and unproductive, because of the lodgment and long resting of the floods thereon which escape from the channel where the levee was wanting far above.

While facilitating rapid drainage in one part of a river may be a great relief to lands above, the immediate result may be an overthrow of protective works on the lower river.

While the efficiency of all natural drains may be greatly enhanced, a partial treatment of them may produce disaster.

In order that this subject may be so understood in all its parts and details with respect to the great valleys of this State, and that system may prevail, a thorough study of the whole field is essential.

In the treatment of a great natural drainage system, the very essence of the work is in the diagnosis of the case.

When causes and effect are thoroughly understood, the remedies are simple enough. As the physician who from long acquaintance understands the constitution of his patient, and knowing where to suspect and look for the seat of disease, quickly detects its locus and nature and then applies the remedy, so the engineer who has opportunity of feeling the pulse and studying the parts of a great drainage system, learns of its defects and can shape a treatment for their correction.

Because there is so seldom a study made of these matters, as a whole, because engineers are called upon to give opinions and design works, without the data to guide them, the long personal acquaintance with the phenomena of the field in which they are called upon to act, and the scope of power to fortify their positions in dealing with the great forces of nature whose ravages they are expected to ward off, we hear of failure.

Now the works designed for the prevention of overflow in this State generally have failed. Millions of dollars have been expended and lost in endeavoring to protect property from inundation.

The State sold swamp lands on condition that they should be reclaimed. In so doing, she set up the owner of one swamp tract against the owner of another; for they both could not succeed without system and harmonious action amongst them all.

They have tried to become harmonized, they have endeavored to extend the scope of operations, and achieve general success, but they have thus far failed.

Not only have the owners of swamp lands been disappointed in endeavoring to prevent inundations of their fields, but new tracts, which were formerly above overflow, which were purchased and settled upon as free from flooding, have become, and others are rapidly becoming, subject to annual submersion; and this, in a measure at least, because of the effects of works constructed for the reclamation of lands sold by the State to be reclaimed.

Through the medium of the Engineer Department, the State has undertaken to collect the data necessary, and shape the works designed to accomplish the desired end of rapid drainage, and it has been my aim to so study the problems involved, as to place their solution upon the highest plane.

With this regard, the extent and location of lands subject to overflow, their characteristics with respect to topographical configuration, and soil and subsoil composition, have been inquired into.

The nature of the floods which submerge them in their several quarters, the manner in which the flood wave is presented, the volume of discharge from the several sources of supply, and the resultant of the combination of those volumes in the march of the wave down the valley, have been observed and studied.

The natural capacity of the channels of drainage, relative or comparative capacity in their several divisions, the effects of artificial constructions in increasing or diminishing their capacity, have been ascertained as far as time and opportunity have permitted.

In doing this, and as a basis for all future study and planning, detailed instrumental surveys of the rivers, and the adjacent lands at governing points of topography, have been made over nearly the whole field. Upon these surveys, as a basis—with the alignments and the size and the grade of the channels known—the march of the floods has been observed, and their volume measured by the most approved methods, at many points.

Now, there are very many obscure influences which affect results over such a wide field as this. Phenomena which escape detection on the first study, may materially change results. Hence the importance of carefully verifying all work—duplicating the study, as it were; and such duty has added greatly to the labors thus far performed, and still demands attention.

THE DEBRIS PROBLEM.

The bearings of this question are too generally understood to necessitate an elucidation of them here. Suffice it to say, that the law requires the State Engineer:

First—Inquire into the question of the flow of debris from the mines into the watercourses of the State.

Second—Ascertain "the relation which hydraulic mining bears to the navigation of rivers and their carrying capacity."

Third—Ascertain the extent of actual and threatened damage to agricultural lands from the debris deposit.

Fourth—"Devise a plan whereby injuries caused by the flow of detritus into the streams can be averted without interfering with the working of the mines."

THE PROBLEMS OF IRRIGATION.

Irrigation, as a process, is just the reverse of drainage.

The mere application of water to land in any one instance is a very simple operation in agriculture.

The engineering works necessary to divert water from a stream, conduct it to lands, and spread it thereon, are in themselves generally simple constructions. But the agricultural methods and the engineering devices employed in irrigation, under different circumstances, are many and varied; and each new locality presents some peculiar characteristic of topographical shape, geological formation, or climatic influence, which may render one or the other of the simple methods or devices in irrigation more applicable than its fellows.

Not only are there material differences in the plans of preparation for irrigation, on account of the shape, soil, composition, etc., in the lands to be watered in each instance, but the character of the crop to be cultivated frequently makes necessary a special disposition of the field, and a peculiar arrangement of works in applying the water; so that in the same locality a great variety may exist in the manipulations and periods of irrigation.

And still again, the influence of irrigation on soils is such, that after the first few years of its practice at a new locality, it may be necessary to change the methods of preparing the lands, in order to effect the economical and rapid distribution of waters.

Now, all these variations in soil, in crops, and in methods of application of water, produce corresponding variations in the amount of water needed, and the periods when it is required to effect the irrigation; so much so, that under extreme circumstances the quantity of water flowing throughout the season, which in one instance will irrigate 600 or 800 acres, in another will only effect the watering of 20 acres. With all these varying circumstances affecting the measure of good which may be derived from the use of water from any source for the purposes of irrigation, it may well be understood that much depends upon the careful adjustment of methods suitable in each instance, and upon watchful management in distributing water, if anything like the full duty is to be obtained from the quantity used.

In new countries, when irrigation is first introduced, the cultivators are not skilled irrigators. As time goes on, they gather some practical knowledge by their own experience, but in each instance such experience is limited to a very small scope. They fall into error, into habits of extravagant use of water, and do not progress in an understanding of irrigation as rapidly as they should. It is only from a comprehensive viewing of the practice—an extended study in detail, with notation of the varied circumstances as they occur—that a just conclusion may be arrived at as to the best methods and means to insure the greatest good from the water used.

Viewed thus, irrigation is an art, and one exceedingly intricate in the modifications of its practice. But it is an art very much abused, and debased to the level of a mere process in agriculture, too often only to suit the prejudices of those practicing it. The instance is not on record where the cultivators by irrigation, over any considerable area of country, have ever voluntarily brought the use of water to near its highest standard, and thereby reaped the greatest possible measure of good from it.

Even in the older countries where irrigation has been practiced for centuries, it is only by continued vigilance, and the exercise of the most stringent regulations, that very great waste is prevented.

Water is the precious element wherever irrigation is necessary. In the use of water, every cultivator becomes the opponent of all others. If each could have all he desired, and whenever he wanted it, the case would be different; but where this could be, irrigation is not a necessity. The water supply for irrigation is itself exceedingly variable, both as regards different localities and in each locality, according to the character of the season and the time of the year. All the Old World experience shows, and moreover the report which is to follow will add testimony to the conclusion, that differences with respect to the distribution and use of water from the natural streams are not settled amicably amongst the claimants, to the best interest of the whole community. It is to the interest of the State that the water from the streams should be used to advantage, that the greatest good may be wrought by its application. And not only is there this apparent interest, which every one will acknowledge, to be subserved, but there is an immediate and pressing necessity for quieting the strife which now exists between claimants of water. By withholding such quarrels from the Courts and adjusting the matter of claims to water, confidence in the future welfare and prosperity of the irrigable regions will the sooner be established, and their development will be promoted, instead of hampered as it is at present.

The State, by throwing open the waters of her streams to appropriation, has directly laid the foundation for their wasteful and injudicious use, and wrangling over their distribution from the natural channels. There is no check whatever upon the appropriator. He makes a claim to water which the law permits him to divert, provided he pursues due diligence in so doing, and converts it to some useful purpose. But he is never required to prove up his claim, to show that he has complied with the law by diligently prosecuting those works necessary to make good faith, and by using the water; much less is there any recognized rule as to what constitutes due diligence; and still less is there any recognition as to what is an economical use of the water.

With the view of collecting and disseminating that knowledge which will enable irrigators to best profit by the use of the water, and with a view of obtaining those data which will enable the State to promote harmony amongst claimants of water, and ultimately enforce an economical use of that precious element, I have shaped the work of this department.

With this regard, the quantity and time of presentation of water in each source of supply are observed; the character and extent of lands which are irrigable ascertained; the data respecting the practical results of irrigation collected and formulated, in order that it may be known how much water will effect the desired end, under the varied circumstances spoken of. The work hereafter mentioned has been conducted with the view to obtaining these last mentioned items of knowledge.

FIELD OF OBSERVATION AND WORK.

The observations and work of the department have extended over the greatest portion of the field described in the former report, although they have during the past season been less evenly distributed than during the seasons of 1878 and 1879.

The irrigation investigation has been prosecuted more especially in Los Angeles and San Bernardino Counties, and on the water supply and storage problems, with a less force, in Kern, Tulare, and Fresno Counties. In the far southern counties, those first mentioned, the work may be regarded as quite complete for one season, but it was impossible with the means and time at command to cover the whole ground in the San Joaquin and Tulare Valleys with equal thoroughness, so that this region will receive more attention next in order.

The drainage work has been confined to the territory embraced in Drainage District No. 1, the Sacramento Valley, for the fund could only be drawn upon through the Board of Directors of the district, and they had only power to undertake work within their district. This work, as elsewhere explained, has been confined to getting information for the projection of local works of improvement, and has not been, as formerly, in the nature of a general investigation of the drainage problem of the valley. The exact location and nature of the works will be explained further on in this report.

In general description of the field of inquiry I respectfully offer another quotation from my former report, with the remark that the range of country is very great, and to appreciate the labors one must contemplate the features of the region studied.

The Sacramento Valley is annually the scene of widespread inundations of lands whose reclamation has been attempted; and almost every year very much property protected by levees is threatened with destruction. The lower portion of the San Joaquin Valley, though less frequently the recipient of floods which bring disaster, is still subject to them, and there still remain thousands of acres of land altogether unprotected from the waters.

These two valleys, joining at one outlet—their rivers having a common delta, and opening to the bay—have afforded the problems of drainage to be studied, and the surveys and examinations for such purpose have been made therein.

The entire length of the San Joaquin Valley, from the Cosumnes River southeast to the Tejon Mountains, is 260 miles. In the lowest portion of the valley are many thousands of acres of land subject to inundation. Immediately alongside of this submersible plain lie two higher ones, in combined width varying from 30 to 60 miles, and extending throughout the San Joaquin, Tulare, and Kern Valleys, the dividing lines between which are almost indeterminable. These high plains require watering, and here has been the chief scene of the inquiry into the subject of irrigation.

The total length of the great valley, comprising the Sacramento, San Joaquin, Tulare, and Kern, is 410 miles, and its area is about 16,060 square miles, which is one twelfth of the entire area of California; it is equal to one half of the area of the State of Maine; it is greater than the area of Holland, and is equal to the area of the valley of the River Po, in Italy.

The area of Sacramento Valley, from Iron Cañon to the Cosumnes River, is about 4,769 square miles.

The area of San Joaquin Valley, from the Tejon Mountains to the Cosumnes River, is about 11,290 square miles.

The waters draining off from 20,213 square miles of hilly and mountainous country, are discharged into this great valley (made up by the San Joaquin, Tulare, and Kern Valleys) by a large number of tributaries.

The entire drainage area of the two rivers above their common outlet is therefore about 56,213 square miles. This area is greater than the combined areas of Maine, New Hampshire, and Vermont, and is greater than the areas of either New York, Pennsylvania, or Louisiana.

The most important of the perennial streams which discharge their waters into the Sacramento and San Joaquin, Tulare, and Kern Valleys, are seventeen in number. They may be enumerated as follows: Sacramento River at Iron Cañon, with a discharge varying from 4,000 cubic feet per second at low water, to about 160,000 cubic feet per second at extreme flood stages. Feather, Yuba, Bear, and American Rivers, whose combined discharges vary from 3,100 cubic feet per second to 200,000 cubic feet per second. Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, Fresno, San Joaquin, King's, Kaweah, and Kern Rivers, whose combined discharges range from about 2,200 to 250,000 cubic feet per second.

The large creeks are over twenty in number. To this class of streams belong: Putah, Cache, and Stony Creeks, which descend from the eastern slopes of the Coast Range mountains into the Sacramento Valley. The greatest discharge of these creeks is in the aggregate about 150,000 cubic feet per second for very short periods of time. Big Antelope, Mill, Deer, Chico, Butte, and Honcut Creeks, which enter Sacramento Valley from the east. Their greatest discharges combined are about 50,000 cubic feet per second. Littlejohn, Bear, Mariposa Creeks, Tule River, White River, and Posa, Caliente, and Tejon Creeks, which enter San Joaquin Valley from the east, possibly discharge as high an aggregate as 60,000. Las Uvas, San Emidio, Los Gatos, Cantua, Big and Little Panoche, Saucelitos, San Luis, Orestimba, and Del Puerto Creeks, which descend from the slope of the Tejon and Coast Range mountains. The total discharge of this class of creeks, which enter the San Joaquin Valley, when at flood stage, is about 100,000 cubic feet per second.

Besides the rivers and creeks enumerated, there are between twenty and thirty smaller creeks which discharge their waters into Sacramento Valley below Iron Cañon. Their greatest discharge is in the aggregate about 50,000 cubic feet per second.

The field in which the practice of irrigation, and the problems connected therewith, have been studied, extends much farther south than the limits of the great valley. It embraces in the vicinity of Los Angeles two valleys, across which flow the Los Angeles, San Gabriel, and Santa Ana Rivers.

One of these valleys lies between the Coast Range and Sierra Madre mountains, and extends from San Fernando to San Bernardino; it has an area of 970 square miles.

The other is the coast valley, which lies between the Coast Range mountains and the Pacific Ocean. The area of this valley is about

800 square miles. The mountain drainage area of the rivers which flow across these valleys is 1,963 square miles.

WORK OF THE PAST YEAR.

THE IRRIGATION INVESTIGATION.

At the last session of your honorable body I had the honor to submit a report, in which I made certain recommendations for the continuance of the work begun twenty months previously. The recommendations in the matter of irrigation were these:

"*First*—That the State Engineer be authorized to ascertain and report the exact condition of all water claims, and works for the diversion of water from the streams and other sources of supply.

"*Second*—That observations to ascertain the extent of the water supply, and the duty of water under different circumstances be continued.

"*Third*—That special examinations be made concerning the possibility and cost of surveying the water supply by storage, and developing it by deep dams, as heretofore spoken of."

In the absence of any special instructions by the Legislature as to the direction which the investigations were to take, it was to be presumed that the recommendations offered were tacitly approved of, and the appropriation which followed for "continuing surveys during the current fiscal year" was the result of such approval. I have accordingly shaped the course of the investigation during the past season in general conformity with these ideas and plans.

The account of the field operations of the department necessarily commences with the thirty-second fiscal year (July 1st, 1880), for prior to that time, and after the former report was made as heretofore explained, but little active field work could be undertaken.

The necessity of looking out for the gauging stations, and the property of the department, prompted the sending out of an assistant in May and June, prior to the beginning of the fiscal year, through the San Joaquin and Tulare Valleys, the emergency being provided for by an arrangement of deferred payments drawn subsequently from the appropriation for the current year. This assistant, Mr. J. D. Schuyler, with a team and one man traversed the entire San Joaquin Valley, visiting all the gauge rods that had been erected upon the various streams, placing them in repair, collecting the records that had been kept, and gathering general data of interest bearing upon the subject of investigations.

This work was carried through to Kern River, where a regauging of the river and its canals was effected, while a party was being organized to undertake the selection and survey of storage reservoir sites in the mountains.

Party Number One.

This party, being the first regularly equipped for the field, was designated Party No. 1, and was placed in charge of Mr. H. B. Choice. It consisted of six men, namely: One transitman, in charge; one leveler; two rodmen; one packer and hunter; one cook. All the members of the party were mounted, and further provided with six pack animals, for transportation, and a complete set of surveying instruments. They took the field July 14th, commencing operations on the headwaters of Kern River. Each of the main tributaries of this stream were examined throughout, and wherever any locality presented apparently favorable conditions for the formation of a reservoir sufficiently capacious to store water in any considerable volume, a survey was made to determine the capacity, character, and probable cost of the work. These examinations were also extended over the water-sheds of the Kaweah, Tule, and King's Rivers, and were only suspended when the party was forced, by danger of being snowed in, to leave the mountains. This party disbanded at Fresno, November 18th, having been out a little over four months. The extent of territory covered by the examination is about 4,000 square miles in area, and the distance traveled by the party about 1,000 miles. Much of the country in the higher regions is a *terra incognita* to all but the few hardy mountaineers, prospectors, and hunters who have penetrated its wild fastnesses; and, on account of its extreme roughness and the absence of trails, presents numerous obstacles to the successful and rapid prosecution of an examination such as was undertaken by this department. The surveys made were only such as would serve to give an approximate idea of the practicability of each site selected for a storage reservoir, its capacity for storage, and the nature and extent of the works required. The location of the dam site having been determined, its height was made dependent upon its length and the area of the valley to be converted into a reservoir; a very large valley, with narrow outlet to be dammed up, admitting of the construction of a higher dam at reasonable cost than a site of lesser area and greater width of outlet. A level contour line, surveyed around the exterior of the valley to define the area of water surface at the proposed elevation for it, and a few cross sections taken at intervals across the valley, completed the survey.

Eight reservoirs were surveyed in the Kern River watershed, covering an aggregate area of 13,916 acres, and capable of storing 15,350 million cubic feet. One on Tule River covering 7,164 acres, with a capacity of 2,675 million cubic feet; three on the Kaweah River aggregating 3,885 acres in area, and 7,162 million cubic feet in capacity; and seven on King's River, with a total area of 1,134 acres, and a storage capacity of 1,665 million cubic feet.

In all, this party ran 64.5 miles of primary or base lines with transit, 70 miles of level lines, and 134 miles of contour lines.

The examination of King's River was not entirely completed, having been cut short by the inclemency of the weather and lateness of the season. Several lakes and valleys are reported as existing in the unexamined territory, which may exceed in capacity anything heretofore found. It was designed to extend the survey to the watersheds of the San Joaquin, Fresno, Chowchilla, Mariposa, and other rivers, as well as the streams heading in the Sierra foothills adjacent to the more arid regions, but the conditions have been too unfavorable to do so this season.

This whole examination, as well as those of a similar nature carried on in other parts of the State, has shown that favorable sites for storage reservoirs where water may be impounded in large quantities, and at reasonable expense, are more rarely met with than has been generally supposed they would be. But the field of investigation is by no means exhausted, for the explorations made were for reservoir sites in the high Sierras, and it is known that many sites exist in the lower foothills, where reservoirs similar to the tanks of India and Ceylon may be constructed and supplied with water through canals from the main streams.

Party Number Two.

After organizing Party No. 1, Mr. Schuyler was ordered to Los Angeles to prepare for active field operations in that section. Party No. 2 was organized and placed in the field August 5th, in charge of Mr. H. J. Stevenson of Los Angeles. The party was composed of seven members, viz.: One transitman, in charge; one leveler; one rodman; two chainmen; one axman and teamster; one cook. A two-horse spring wagon and team afforded all the transportation required.

To this party was assigned the work of making certain surveys for the purpose of determining the position of the irrigable lands which may be watered from the principal streams of the Sierra Madre Range. From the cañon-mouth of the San Gabriel River, the largest and most important in the country—a grade line was run to the westward a distance of twenty miles, terminating in a series of five reservoirs in the low range of hills here forming a link in the Coast Range. On the east side a similar line was run a distance of fifteen miles, and other reservoirs selected and surveyed. Work of a like character was performed in the territory adjacent to the Arroyo Seco, Verdugo, and Tujunga Cañons.

The party disbanded October twenty-ninth, having completed 68.5 miles of main transit lines with levels; 25.5 miles of offset lines; surveys of 13 reservoir sites; and gauging of 30 streams and ditches.

After its disorganization, three of the members of this party were selected for a small special gauging party, which was placed in charge of Mr. S. Harrison Smith. This party remained in the field till December seventh, gauging the various streams and ditches of Los Angeles and San Bernardino Counties, when they were disbanded. The total number of water-courses, ditches, natural and artificial artesian streams gauged by it is 88, the whole number of gaugings taken being 183.

Party Number Three.

Party No. 3, organized in San Bernardino and placed under the charge of F. T. Perris, being engaged almost exclusively in reservoir site surveying, was composed of fewer members than Party No. 2.

Its full membership was as follows: one engineer in charge; one rodman; one axeman; one teamster; and one cook.

The party took the field August 13th, continuing at work until October thirty-first, when it was called in and disbanded. The field of operations lay in the mountains and foothills of San Bernardino County, and the southern part of Los Angeles County—their first work being a determination of low-water discharge of the streams flowing into the valley of San Bernardino, followed by a series of reconnoissances and surveys of reservoirs and routes for channels of collection and distribution of water into and from the projected reservoir sites.

The work accomplished by this party in its ten weeks of service may be summarized as follows: Main transit lines, with levels, 17 miles; secondary lines, with levels, 36.52; level lines, 5.78 miles; reservoir sites surveyed in San Bernardino County, 7, having a total area of 3,110 acres and a capacity equivalent to a layer one foot deep over 65,600 acres; reservoir sites surveyed in Los Angeles County, 3, having a total area of 715 acres and a capacity equal to supplying 13,850 acres one foot in depth; gauging of streams, 23.

SOIL EXAMINATIONS.

One of the first objects to be attained in a study of an irrigation district and its water supply, is a determination of the characteristics of its soil and subsoil with special reference to their behavior under irrigation, and their adaptability to artificial watering. Even in districts whose soil is generally of the best, there will always be found a portion which is unfit for irrigation and which should of course be omitted in any general calculation of water supply needed for irrigating the district. There is much land too in irrigating districts which is naturally moist, requires no irrigation, and needs no provision of water supplies.

To determine the position and area of these tracts, the nature of the soil and subsoil in the dry lands and the natural boundaries of the irrigable and non-irrigable land, requires detailed examination of the whole territory by men of experience and judgment. This branch of the general field of inquiry has received special attention the past season in Tulare, Fresno, Kern, Los Angeles, and San Bernardino Counties. Local engineers and surveyors most familiar with the country were generally employed in the duty, which embraced as well the collection of facts and figures on the practice of irrigation; its cost by various methods; the water quantity required for effective irrigation on the various classes of soils; a correction of the topography of existing maps by sketches made on the ground upon plats of large scale; a study of the artesian water supply by gathering of complete data on the number, size, cost, depth, and flow of artesian wells; and the notation of such other special information as is essential to a thorough grasp of the subject. From time to time nine persons have been employed in this work, which has been carried over the greater portion of the irrigable territory in the counties named. Here, as in other departments, field work has been suspended, with the single exception of an assistant in Los Angeles, who is completing the reconnoissance of the district assigned him in the Summer.

THE BORING PARTY.

As early in the season as the assistant in charge could attend to it, a party was organized to make borings in the beds of some of the principal streams, for the purpose of determining the depth and nature of the impervious substrata, and the feasibility of constructing submerged dams founded thereon for forcing the underflow of the streams to the surface, and thus increasing the available water supply for irrigation. The party consisted of an experienced well-borer and two helpers, with a complete outfit of boring tools. One of the former members of Field Party No. 2 was placed in charge, and work was commenced November 5th, in what is known as the Bedrock Cañon of the Santa Ana River, where that stream breaks through the Coast Range. A month was occupied in making these explorations at this place, when, on account of the lateness of the season, further work was suspended.

MOUNTAIN RECONNOISSANCE.

While all this work was in progress in the valleys, the assistant engineer, under whose immediate supervision the field irrigation investigation was conducted, occupied a large share of his time in making reconnoissance of the Sierra Madre and San Bernardino mountains, to determine whether or not there existed any favorable sites for the storage, in large quantities, of the surplus Winter supply of the mountain streams upon their headwaters, and thus direct the work of the field surveying parties. The Santa Ana, San Gabriel, and Los Angeles Rivers and their principal tributaries, were carefully examined from the mouths of their cañons to their sources, and the general character of the mountain water-sheds studied throughout.

OFFICE WORK.

The compilation and deduction of results from the great mass of data obtained from these various sources involves much arduous labor before they can be arranged in a form acceptable to the non-professional reader. It is being pushed forward as rapidly as possible in this office, and the results will be presented in the form of Appendices to this report as fast as completed.

WATER RIGHTS.

An endeavor has been made to arrive at some definite understanding of the nature and extent of existing prescriptive rights to the use of water in the several irrigation districts in which the other examinations were being conducted, and to this end experts were employed to make abstracts of titles from the county records of such rights as could thus be defined. These abstracts have been arranged in convenient tabular form, and are added to the archives of this office. They will be of immediate and great value if the steps which are recommended in Part Four of this report are authorized to be taken. Meanwhile, they serve as a basis for conclusions hereafter to be advanced.

THE DRAINAGE WORK.

By the passage of the "Act to promote drainage," a new line of duty was imposed upon the State Engineer. Theretofore his operations were solely of a preliminary nature—*investigations* made with the view of finding out the possibilities in the several problems into which he was called upon to examine.

The drainage Act contemplated the construction of works to improve the water-carrying capacity and navigable qualities of the main and tributary streams.

In the view of the case taken by the Legislature, it was made necessary by the results of the operations of hydraulic mining.

The holding back of so much of the mining detritus as can be stored is a necessary adjunct to the drainage work proper; and the improvement of the river channels—the real work of drainage—is necessary to be done before the low lands can be reclaimed, the towns and cities of the alluvial districts protected from inundation, and the navigation of the streams maintained.

The law requires the State Engineer to report concerning the formation of drainage districts, to prepare plans and specifications for the works, after districts are organized, and to supervise the constructions undertaken.

As has been observed, this is a line of duty distinct from that contemplated by the original Act organizing the State Engineer Department, and it is in this chiefly that the drainage work of the department has been conducted during the season since May of the present year.

DRAINAGE DISTRICT NUMBER ONE.

Under the drainage Act, a district for the Sacramento Valley was formed in May, 1880, which was called Drainage District No. 1.

An account of the proceedings attending the formation of this district, and the record of the duty performed by the State Engineer in connection therewith, are appended to the next part of this report.

I now submit a statement of the work subsequently performed by myself and assistants in the matter of drainage.

THE PREPARATORY ENGINEERING WORK.

Preliminarily it is to be understood that the work of the State Engineer Department, under the drainage Act, except as to the matter of general supervision or inspection of works on the part of the State Engineer, is confined to projecting or planning works.

Under the law, the Directors of the drainage district have the services of a Resident Engineer, who takes active charge of construction and measurement of work in the field after the projects for the same have been made by the State Engineer.

Owing to the great haste in which it has been necessary this year to prepare work so as to be in time to take advantage of the season when it could be performed, the duties of the State Engineer's force, and that of the Resident Engineer of the drainage district formed, have not been so clearly defined or adhered to, as they probably should be, so that it is difficult to report in brief the work of this department without perhaps including something done under direction of the Resident Engineer, or leaving out something done under my own immediate supervision.

Thus, field parties have been transferred from one department to the other during the season, or the organization broken up and divided, and sometimes for limited periods, and from motives of economy and convenience, one party has been performing duties which properly in part belonged to both departments.

Operations have been carried forward under many difficulties, not the least of which has been the unhealthfulness of the localities in which the parties had to work and camp. Frequent severe attacks of malarial fevers and other ailments have resulted to the employés. Not a party has escaped; but few individuals have gone through the season without an attack compelling cessation of work for several weeks. Some have been seriously ill, and one death has occurred.

The first work of the department under the Act to promote drainage, was the establishing Drainage District No. 1.

This necessitated the compiling of a map of the Sacramento Valley and its water-shed area, and the outlining thereon the boundaries of the district, which necessitated the performance of some field surveying to trace out the proper boundary where the water-shed line was indistinct.

The work of one party for nearly a month was given to the field duty spoken of, and the work of two draughtsmen for as much as a month and a half to the office work.

As above remarked, this duty preceded the organization of the drainage district, and all else connected with the drainage work has been done since that time as preliminary to the projecting of plans for, or the commencement of works which the Directors of the drainage district determined to undertake.

The examinations for the location of such works of drainage as have been projected for commencement during the past season have been made principally by three field parties, as follows:

Party No. 1, operating on the Upper Sacramento River;

Party No. 2, on the Feather, Bear, and Yuba Rivers;

And Party No. 3, on the Lower Sacramento and American Rivers.

The organization and work of these parties was substantially as next described, although frequent changes were made according to the special duty in hand.

Party Number One.

Party No. 1.—This party was organized during the latter part of July, and commenced work on the first of August. It was quartered in one of the arks belonging to the department and was furnished with tents, teams, and wagon for operations not convenient to the river. The outfit consisted of such instruments as were needed for accurate and thorough mapping, and for locating works. Its membership was as follows: One Assistant Engineer in charge, one plane-tabler, one leveler, one or two rodmen, two chainmen, one flagman, one to six axemen, one driver, one cook.

During August it was engaged in making detailed examinations and surveys on the Upper Sacramento River, from Chico Landing to Riley's Cut-off, a distance of about twenty miles. All levees, old river channels, and the hardpan banks standing back from the river, were carefully mapped.

This work extended over an area of more than thirty square miles. From the thirtieth of August to the tenth of September the party was disbanded from sickness of its members. During the remainder of September and to the middle of October, Party No. 1 was engaged in examinations from Chico Creek to Butte Slough.

On October 15th, for the convenience of the work of the Directors of the drainage district to facilitate commencement of work of construction on the Upper Sacramento River, Party No. 1 was transferred to the service of the Resident Engineer, and thereafter was engaged in staking out and measuring work being done under contract above Colusa.

The work accomplished by this party is classified as follows:

Detail topography (plane table work)	46.5 sq. miles.
Levee and channel lines surveyed	54.1 miles.
Traverse surveys (transit)	98.8 miles.
Levee location	44.0 miles.

Party Number Two.

Party No. 2.—This party was organized on June twenty-fourth, having been previously engaged in the survey of portions of the boundary lines of Drainage District No. 1. It was occupied from June twenty-fourth to July first in surveys on the left bank of American River, near Brighton, and on July first was transferred to the vicinity of Marysville, and has been occupied to date in making special surveys of portions of Feather, Yuba, and Bear Rivers, in locating dams, levees, and channel lines on these streams.

The party was engaged on Yuba River until the first of August, when it was transferred to Bear River. On the completion of the location of the dam on Bear River, with such other work as was necessary preliminary to the commencement of operations by the drainage district authorities, this party was assigned to the duty of accurately surveying and cross-sectioning the reservoir space above each of the dams, located, one on the Yuba, and one on the Bear River, with the view of ascertaining, by a comparison of results to be had from future surveys, the effect of the structures in the matter of arresting the detritus.

The party varied in strength according to the requirements of the work. Its general organization was as follows: One Assistant Engineer, in charge as transitman or plane tabler; One Assistant Engineer as plane tabler; one or two levelers; three to four rodmen; two chainmen; one to four axemen; one driver; one cook.

The outfit comprised complete instruments for the work assigned, with draughting instruments and materials, two wagons and teams when necessary, and one at all times. During the latter part of the time it was furnished with tents.

The topographical survey of the Bear River reservoir site was completed, and that of Yuba River was nearly finished, when about

December sixth the work was suspended on account of the necessity for economy in expense for the remainder of the year, and the party was disbanded.

The work accomplished during the season by Party No. 2 is classified as follows:

Detail topography (plane table work)	19 sq. miles.
Transit and level lines (1st class)	67.1 miles.
Level lines	22.3 miles.
Level and transit cross sections (reservoirs)	24.0 miles.
Transit lines (2d class)	10.1 miles.
Level and transit cross sections (2d class)	10.6 miles.

Besides the large amount of leveling necessary for the plane table topographical work, which cannot be accounted for in miles traversed.

Party Number Three.

Party No. 3.—This party was organized in the latter part of July, and was engaged for about three weeks in making special examinations of portions of Sacramento River, from Knights Landing to Sacramento City—particularly at the various crevasses on the west bank—and in similar examinations of the lower portion of the American River. It was quartered in one of the arks in use by this department for the past two seasons, and was furnished and equipped for the character of work to which it was assigned.

Its membership was as follows: One Assistant Engineer, in charge; one transitman and leveler; one rodman; two chainmen; one axeman; one flagman; one cook.

This party was transferred to Drainage District No. 1 on the thirteenth of August, the Assistant Engineer having been chosen by the Board of Directors of that district as their Resident Engineer.

The amount of work done by Party No. 3 cannot be justly accounted for in miles of line surveyed, for its labors were principally in the examination and surveying of the washouts or crevasses in the levee west of the Sacramento below Knights Landing, and the surveys made were thus mostly small local examinations.

ASSISTANTS ON DRAINAGE WORK.

Messrs. M. Manson, C. E. Grunsky, and A. Boschke have been my principal assistants on the preparatory work of the drainage branch of the season's operations, and have been, at times, in charge of one or the other of the two first mentioned parties.

Mr. C. D. Rhodes was the assistant in charge of Party No. 3, when he was chosen Resident Engineer by the Directors of the Drainage District.

JOINT WORK WITH THE UNITED STATES ENGINEERS.

By authority of Congress, and under the direction of the Secretary of War, through the Chief of Engineers of the United States Army, Colonel G. H. Mendell, of the Engineer Corps, has had surveys made in considerable detail of the American, Cosumnes, Mokelumne, Calaveras, Stanislaus, and Tuolumne Rivers, and some intermediate creeks, from their respective cañons out into the plains; in each instance for fifteen to twenty-five miles in length.

These surveys were made more especially with the view of studying the subject of storage of mining detritus, upon which Congress desired an official report; and, according to an understanding between myself and the Engineer in charge, copies of the result of the work of this department, made in the rivers further north, are to be exchanged for copies of the results of his work.

This will afford the data also for a study of the diversion of water from these rivers for purposes of irrigation; so that the State Engineer Department will soon be possessed of valuable information upon the engineering phase of the irrigation problems in Sacramento, San Joaquin, Stanislaus, and Merced Counties. And, taking these surveys as a basis, the investigation will be carried forward in the counties mentioned during the ensuing Spring and Summer.

The fact that surveys of the above named rivers were to be executed by the United States Engineers, accounts for this department not having commenced operations in the counties mentioned during the past season.

The survey of the American River was made by a party organized and directed, under my supervision, by Mr. M. Manson of this department, but the cost of the work was paid by Colonel Mendell, to whose satisfaction and according to whose ideas the work was done, and the results primarily belong to the Government, although the State will have copies of them.

This field work was conducted during the months of November and December, and closed about the twenty-first of the latter month.

The work completed by this party was as follows:

Detail topography (plane table work)	16.5 square miles.
Traverse lines (plane table work)	47.1 miles.
Transit and level lines (1st class)	55.7 miles.

OFFICE WORK.

During the past year the office work of the department has been more important than formerly. It has included the preparation of the report made on the formation of Drainage District No. 1; two extended reports to the Directors of the Drainage District; a schedule of works for the district, together with estimates, plans, maps, etc.

Plans and specifications for the drainage work were prepared as follows:

1. For a dam upon the Yuba River.
2. For a dam upon the Bear River.
3. For levees and brush work on the Yuba and Bear Rivers.
4. For channel improvements on Feather River.
5. For bank building on Feather River.
6. For bank building and leveeing on the Upper Sacramento River.
7. For bank building and channel improvements on the Lower Sacramento River.
8. For closure of crevasses on the west bank of Sacramento River, near American River.
9. For bank building on the east side of the Sacramento, just below Sacramento City.
10. For bank building and protection on the American River, near Sacramento.

The specifications explain the nature, extent, and intent of these works, and their general relation to the plan of operations is apparent from the reports made to the Board of Directors.

Most of the office work throughout the season has been connected with the drainage branch of duty, in preparing for work of construction, arranging and studying the results of field work performed during the seasons of 1878 and 1879.

The office employés were paid from the irrigation appropriation or from the Drainage Fund, according to the duty they were assigned to from time to time.

The following table gives the amount of work of each class performed in the office during each month of eighteen hundred and eighty.

TABLE OF OFFICE WORK IN 1880, AS PER ONE MAN.

Classes of Work.

MONTHS.	Preliminary Mapping	Final Mapping	Calculations and Estimates	Preparations of Reports	Profiles and Tracings	Miscellaneous Office Work	Plans and Specifications	Total Months
January	--------	--------	1	5	2	1½	--------	9½
February	--------	--------	1	3½	2½	1	--------	8
March	2	1	1½	--------	2½	1	--------	8
April	--------	2	1	--------	1	1½	--------	5½
May	1	1	1	--------	1½	1	--------	5½
June	--------	1	1	--------	--------	--------	2	4
July	--------	1	1	--------	--------	--------	2	4
August	1	1	--------	--------	1	½	1½	5
September	1	2	--------	--------	½	½	1	5
October	1	2	--------	1	½	½	1	6
November	1	2	--------	--------	1½	½	--------	5
December	1	2	1	3½	1	1	--------	9½
Totals	8	15	8½	13	14	9	7½	75

Or six years and three months work for one man.

GENERAL MAP OF THE STATE.

An important labor in the office during the past year has been the projection and partial completion of a map of the entire State.

In my work of studying the drainage system, map making for Drainage District No. 1, studying the water supply drainage areas for irrigation, and the outlining of irrigation districts, the necessity for a reliable general map as a key, and detail maps on an uniform scale and method of projection, was felt, and had to be supplied in a measure for a large portion of the State.

This led to the projection of a map of the entire State, for the parts could not be correctly worked in, except upon a projection of the whole.

Realizing that the result of this work could not fail to be of great interest to the citizens of the State at large—seeing that there is absolutely no map of the State at all complete or correct—I have pushed this work forward, and now have it well under way. The State map is drawn to a scale of six miles to the inch, and will occupy a sheet about ten feet square. It is laid down on what is technically known as the polyconic projection, and the greatest care has been taken to make this formation with mathematical accuracy.

The astronomical and geodetic work of the United States Coast and Geodetic Survey, the United States Geographical Surveys, and the State Boundary Surveys, have been used as the basis of this map.

Detail information has been collected from all Government and State surveys, private surveys, and the work of this department. No pains will be spared to make this a complete and useful work, and I respectfully represent that it may well be published as fast as completed, at State expense, and sold at cost price for the benefit of her citizens and the public generally.

THE CONSULTING ENGINEERS.

In July of the past year Mr. James B. Eads, Civil Engineer, of St. Louis, Missouri, at the request of his Excellency, the Governor, joined Colonel G. H. Mendell, who had served as Consulting Engineer during the two years previous, and myself, for consultation on the drainage problems of the Sacramento Valley.

We examined the principal portion of the field of operations together, and examined the data previously collected by surveys and compiled in the office.

I take great pleasure in acknowledging the courteous coöperation of the gentlemen mentioned, and refer with satisfaction to the fact that my projects submitted to them have, in all main, essential points, been approved.

Very respectfully, your obedient servant,

WM. HAM. HALL,
State Engineer.

REPORT

OF THE

STATE ENGINEER

TO THE

Legislature of the State of California--Session of 1881.

Parts II and III (in One).

THE PROMOTION OF DRAINAGE,

Including River Improvement and Storage of
Mining Detritus:

SACRAMENTO:
STATE OFFICE : : : J. D. YOUNG, SUPT. STATE PRINTING.
1881.

REPORT.

Office of the State Engineer,
Sacramento, January 10, 1881.

To the honorable the Senate and Assembly of the State of California:

The drainage engineering work prosecuted during the past year, has been entirely directed towards carrying out the provisions of the *Act to promote drainage*, with the exception of a limited amount of office work prosecuted during the first three months, in compiling and studying the results of the previous season's field work. There was no provision made by the last session of the Legislature for carrying on the work of investigation of the general problems of drainage begun under the law of April, 1878, by virtue of which a report was made on the improvement of rivers and the flow of mining detritus, in January of 1880. Hence, no report can be made at this time which will throw any material additional light upon the subject at large.

The *Act to promote drainage* does not require the State Engineer to report to the Legislature, nevertheless I propose to submit an account of the duties performed, a description of the works undertaken, and an outline of projected operations for the future.

DRAINAGE DISTRICTS.

The first duty devolving upon the State Engineer, under the Drainage Act, was that of studying the subject of drainage districts in California, reporting upon the same, and, from time to time, recommending their formation to the State Board of Drainage Commissioners. In compliance with the instructions contained in the law, on the twenty-sixth day of May, I submitted to the Governor, as President of the State Board of Drainage Commissioners, a report recommending the formation of a drainage district in the Sacramento Valley. With the permission of the Governor and State Board, the report is presented here for convenience of reference, and in explanation of all that has been done by the State Engineer in the matter of forming drainage districts.

REPORT OF THE STATE ENGINEER ON THE FORMATION OF DRAINAGE DISTRICTS.

Governor George C. Perkins, *President of the State Board of Drainage Commissioners, and to the State Board of Drainage Commissioners:*

Under and by virtue of the law entitled *an Act to promote Drainage*, it has become the duty of the State Engineer to report to the Board of which the Governor is made President, concerning (1) "The results of his investigations as to drainage," and (2) "The results of his special examinations, made with reference to the division of the State into several drainage districts," as well as (3) to "propose boundaries for such districts and recommend their formation." (See section two.)

The general results of investigations hitherto made by the State Engineer into the matter of drainage in the great valleys of the State, have been embodied in the second and third parts of my report made to the Legislature, during the month of January of this year. That paper was prepared in compliance with instructions incorporated into the law, approved March 29th, 1878, which created the office of State Engineer, and required the incumbent thereof to report in this connection, concerning the principles which ought to govern in the relief of rivers when in flood, in the improvement of the large streams as navigable channels, and in the management or disposal of mining detritus. A general treatment for the whole field observed and studied—more particularly that of the Sacramento Valley—is given in the parts of my report spoken of, which are entitled a report upon "The Drainage of the Valleys and the Improvement of the Navigation of Rivers," and a report upon "The Flow of Mining Detritus," respectively.

It is believed that the law, already referred to, which has called the State Drainage Commission into existence, is based in a great measure upon the leading conclusions put forth in these papers; and, as preliminary to the outlining of districts and the formation of definite plans for works, it is thought these conclusions, with the general treatment of the problem which has led up to them, constitute a sufficient ground for action. As a compliance with the first instruction, namely: "That the State Engineer shall submit * * * a report or reports containing the results of his investigations as to drainage." I transmit a copy of the special reports above mentioned as already submitted to the Legislature.

Preliminary to the general designation of boundaries for a drainage district or districts, it is not necessary under the law, after what has been done, for one acquainted with the country, to make any "special examinations," other than those which can be made upon maps in this office, "with reference to the division of the State into several drainage districts." In the first place, I presume that it was the intention of the Legislature that districts should be formed only where a necessity existed therefor. The State Engineer is instructed to "propose boundaries for such districts" "from time to time" only. Now, it is well understood that the necessity is most apparent in the Sacramento Valley; and, therefore, I have specially examined and studied that case—as to what should constitute a drainage district under the law, and what territory would be embraced in any district to be formed in the Sacramento Valley, to carry out the letter and spirit of the law—and upon it I propose to report now.

DRAINAGE DISTRICTS.

The Legislature has authorized the formation of districts, each of which shall act as an unit in the matter of promoting the drainage of its territory, and has established a rule of action to be followed in putting this provision of the law into force. Thus, in requiring the State Engineer to propose boundaries for drainage districts, it lays down the rule to be followed by him in outlining such tracts, by saying that "each * * * shall include a territory drained by one natural system of drainage;" so that this officer is required to act primarily in the capacity of an expert in the matter of designating the several territories in the State, each of which is drained by one natural drainage system.

While he is expected to propose boundaries for districts, it is only as to the necessity for their existence, and the time at which he will recommend their formation, that he is left without a rule to govern him; for the law distinctly says that he shall "propose boundaries for *such* districts," namely: districts each of which includes a territory drained by one natural system of drainage. The only points he has to consider then are, as to what constitutes such a territory, and what lines bound such territories in the region where it is reasonable to suppose the Legislature intended this law to apply, or where there is a necessity for its application; and that region, as I have said before, is more particularly the Sacramento Valley.

The removal of the surplus waters of a region through the action of the force of gravity alone, where the water finds an escape through channels not artificially formed, constitutes *natural* drainage. Such drainage is complete when the waters have reached their ultimate outfall at the level of the sea, and find no further plane of inclination along which to course under the influence of gravity. A drainage system is an aggregation of drains tending towards a common point of outfall, and whose waters usually approach that point through one channel common to all. A natural drainage system is made up of the main and all subsidiary and tributary channels within the limits of a watershed area, and such an area constitutes "a territory drained by one natural system of drainage."

Hence the whole of the Sacramento Valley, and the watershed of the entire Sacramento River—the main stream and its tributaries—constitutes a territory which, under the law, the State Engineer is obliged to designate as a region suitable to be formed into a drainage district.

DRAINAGE AND RECLAMATION DISTRICTS.

It is well at this point to consider for a moment the difference between a drainage district and a reclamation district, seeing that they must both exist under the order of things to be inaugurated by the *Act to promote drainage*.

A reclamation district is properly a tract of land which may be protected from overflow by one continuous bulwark or levee; a tract not separated or divided by any stream which must be left open to carry away the waters of floods; a tract so formed topographically that flood waters gaining admittance at the head, or upper end, must necessarily spread over all below, there being no main stream or high point of land to intercept or divert them; and, consequently, a tract which generally should and often must be entirely protected, in order that any considerable portion may be safe from inundation. For instance, each of the great lowland basins in the Sacramento Valley, together with the plains bordering it, and subject to occasional overflow, constitutes a natural reclamation district; and also each of the islands lying in the delta of the San Joaquin and Sacramento Rivers should be regarded in the same manner. We consider such a tract as a district, because all of its parts are interdependent in the matter of protection from overflow, which in nature may be the case either absolutely or in a less and varying degree. Examples of every degree of interdependence may be found in the natural reclamation districts of the Sacramento Valley; and in some instances, but not frequently, one of such districts may be divided, without serious detriment to either part, in a scheme for reclamation.

As we have seen, a drainage district should include at least all of the territory within any drainage area which embraces within itself the channels or routes of escape for the waters which are to be conducted away. In the simplest case which we may with reason depict, where a single stream without tributaries courses through a valley, with a marsh or basin on each side, a drainage district, as here defined, will include at least two reclamation districts. In the Sacramento Valley, while there should be but one drainage district, there must of necessity be ten or twelve reclamation districts.

Aside from the great main drainage of a district, as here spoken of, there must be drainage also for the lower lands of the several reclamation districts. This drainage is of another character—in a varying degree in each instance—from that with which the *Act to promote drainage* proposes to deal; just as house drainage and plumbing in a city differs from the main sewerage system; and just as sub-drainage of agricultural lands differs from the opening out of the stream into which its waters are conducted; or, in the converse proposition of irrigation, just as the distributing and farm ditches differ from the main canal works of the system.

To be completely reclaimed all lands in a reclamation district must be drained, if otherwise too wet for cultivation, or other agricultural use to which it may be desired to put them, but it is not necessary that all lands of a drainage district shall be reclaimed before we may say that such district is well drained; and yet, before all, or nearly all, lands in a drainage district can be reclaimed, the district, as such, must be well drained. Hence we have the word "drainage" used in a double sense—as we apply it to the drainage of individual tracts, without regard to the great natural drainage ways, or as we apply it to the drainage area of which such natural channels constitute the drains.

In the case of the reclamation district, we plan against overflow of the lands, with an eye single to the one object of holding off the flood, no matter what other tracts it may cover; the volume of water, the capacity and condition of the channel in which it must escape, is not considered.

In the case of the drainage district, we are to look upon the river as a sentient being, a living organism, in which each main and tributary channel, with its floods, is to be considered as an integral part not to be dispensed with, and whose influence cannot be neglected. We are to plan for the expansion and adjustment of the parts of this monster, in order that it be self-contained; we are to improve the channels, with an eye single to the waters to be cared for, without special regard for the lands of any particular reclamation district.

In case of the reclamation district, we look upon its lands and its levee: Are the levees long enough and high enough to keep the waters off this tract?

In the case of the drainage district, we contemplate its rivers and their waters: Are the channels of good regimen, and of sufficient capacity to receive and carry away the flood waters?

Now, in the Sacramento and San Joaquin Valleys, we have these questions to answer. Those with respect to drainage districts must be responded to favorably—in the affirmative—the channels must be of good regimen and sufficient capacity to receive and carry away the waters of ordinary floods, before reclamation of the adjacent lowlands can ever be effected.

In addition to this situation presented naturally, we have, in the Sacramento Valley particularly, the complication brought about by the effect of detritus from the mines, which is filling the main channels for a considerable portion of their length, and thus destroying their efficiency for the whole valley, both as drains and navigable rivers.

In the report submitted by myself, as State Engineer, to the Legislature in January, certain remedies for these evils were proposed. Various methods of disposing of the mining detritus were suggested: preventing it from entering the cañons, when it can be otherwise disposed of; storing it in the cañons, on the flats at the mouths of the cañons, or on the plains, by means of dams and embankments; and diverting the waters carrying it into the lowland basins.

It was pointed out that the application of no one of these methods would afford complete relief. It was shown that they must be availed of each, according to the particular circumstances of the case, and all in a degree at least. And it was distinctly set forth that a systematic treatment of the drainage ways of the valley must accompany any efforts to dispose of this mining detritus, in order that the benefits therefrom might be made apparent.

The Legislature passed the *Act to promote drainage*, properly known as the "Debris Bill," and under it, I presume, all of the works are to be undertaken which may be necessary to accomplish the desired results.

A DRAINAGE DISTRICT FOR THE SACRAMENTO VALLEY.

I am clearly of the opinion that but one drainage district can be formed in the Sacramento Valley, and that the "territory drained by one natural system of drainage" in this case comprises all of the area whose waters shed into its drains. This territory may be described as follows:

Commencing on the north bank of the Sacramento River at the mouth of Montezuma Slough, and opposite the junction of the Sacramento and San Joaquin Rivers, and running thence in a northeasterly direction to the summit of the Montezuma Hills; thence following the ridge line of the watershed between the Sacramento and the Suisun Valleys in a northerly and northwesterly direction, and the ridge line of the watershed between the Putah and Suisun Creeks, and between the Putah and Napa Creeks, in a northwesterly direction, and the ridge line of the watershed between the Clear Lake basin and that of Russian River to Mount St. John; thence northerly along the crest of the Coast Range of mountains to the divide between the waters of Trinity River and those of the Sacramento River; thence along said divide northerly and easterly to Mount Shasta; thence southerly, easterly, and northerly along the line of watershed which flanks the drainage area of Pit River, and returning to the south again, following said divide or watershed line to the summit of Lassen's Peak; thence following the crest of the Sierra Nevada mountains to the head of the dividing ridge between the basins of the American and Mokelumne Rivers; thence westerly down the said dividing ridge to the dividing ridge between the basins of the American and Cosumnes Rivers; thence westerly down said last mentioned dividing ridge to the edge of the swamp or overflowed land lying east of the Sacramento River; thence following the eastern boundary of said swamp or overflowed land southerly to the Mokelumne River; thence down said river to its junction with the San Joaquin River, and following the course of the San Joaquin River to a point opposite the place of beginning at the mouth of the Sacramento River.

Including all of Solano County which slopes toward the Sacramento River; all of Napa which drains into Putah Creek; all of Lake which drains into Putah Creek, Clear Lake, and Cache Creek; all of Yolo, Colusa, Tehama, and Shasta Counties; all of Siskiyou and Lassen Counties which drain into the Upper Sacramento, McCloud, and Pit Rivers; all of Plumas and Lassen Counties which drain into Feather River; all of Butte, Sutter, and Yuba Counties; all of Sierra, Nevada, and Placer Counties west of the summit line of the Sierra Nevada mountains before mentioned; all of El Dorado County west of said summit and north of the ridge between the basins of the American and Mokelumne and American and Cosumnes Rivers; all of Sacramento County north of the ridge line crossing the plains from said mountain ridge to the swamp land line, and all of the swamp lands in Sacramento County.

RECOMMENDATION.

Now, therefore, in view of the instructions to the State Engineer, contained in section two of an Act entitled *an Act to promote drainage,* approved April 23d, 1880, I report that I have made such "special examination with reference to the division of the State into several drainage districts," as seems to me necessary for the purposes of a partial report at this time; and that I recognize in the region whose outlines have just been given, and which embraces the Sacramento Valley, together with the watershed areas of the Sacramento River and all its tributaries, a "territory drained by one natural system of drainage," and that as a consequence, it is one which must be designated by me as suitable to compose a drainage district.

And in view of the necessity which exists in the said Sacramento Valley for immediate action in the matter of restraining the flow of sands into its navigable rivers, and for treating such rivers for their improvement, in order that drainage may be promoted and the streams saved from further deterioration, I recommend that a drainage district be formed in said Sacramento Valley, to embrace the region naturally draining into its rivers, as before described.

THE DISTRICT PRINCIPLE.

In providing for the formation of such districts, the Legislature has recognized the principle which governs in the outlining of sewerage districts in large cities, namely: that there is a community of interests, an interdependence between the land surfaces from which drainage waters are shed and those over or through which they may run.

When it was first proposed that lot holders at the extreme head of a valley, where a drain or sewer was hardly necessary at all, and at most a very small pipe would suffice, should pay an ad valorem tax on their lots, towards the construction of the large sewers at the lower end of the district in the city, the idea, doubtless, did not meet with favor; and in new countries the reasonableness of the point in the case cited is frequently overlooked, as it has been in California.

But in older lands this view is becoming more and more accepted, so that drainage works for large areas of country, as well as sewerage systems for cities, are constructed by district coöperation, upon the principle that each piece of property which contributes sewage or drainage waters, to be carried down and delivered at the ultimate outfall, is interested in the efficiency of every foot of sewer or drain through which such sewage or drainage waters must run to reach that point; and also upon the corelative principle, that all property thus dependent upon an indispensable part of an important system, is interested in the success of the works as a whole, and hence should bear a portion of the cost of their construction and maintenance.

Many cases of the application of this principle in the ordering of public affairs might be cited; the community of interest is recognized in taxing unimproved and unoccupied property to meet the cost of constructing waterworks, as is frequently done by municipalities; and the operation of our public schools depends largely upon tax revenues, collected from those who have no possible concern in the working of the educational system, other than a general interest in the welfare of the country; this latter to be advanced by cultivating, at public expense, the minds of people who otherwise might remain ignorant.

As I have before remarked, it seems that in establishing a rule for guidance preliminarily, in the matter of designating regions which might properly be organized into drainage districts, the Legislature has recognized this principle as fitting, and directed its application, by saying that each drainage district as primarily designated by the State Engineer, shall consist of a territory drained by one natural system of drainage; thus in effect defining a *drainage district.*

In the primary designation of districts under the *Act to promote drainage,* I must apply this definition in its broadest sense; for just as soon as I depart from such application of it, then do I cut loose from the rule, and the outlining of a district becomes a mere discretionary action to be influenced by judgment as to equities or necessities; and, acting as an expert, I have no such discretionary power.

For instance, it may be said that the Feather River basin comprises "a territory drained by one natural system of drainage," and hence should be designated as a drainage district. Now, the Feather River is a branch of the Sacramento, emptying into that stream about sixty miles above its outfall into the bay. If I may name its drainage area as a proper district under the rule laid down, so might I just as well name the country drained by one of its tributaries—the Bear River, for instance—and then a tributary of that smaller stream might with equal reason be selected, and so on down, until I would find myself designating the most restricted valley with a single rill running through it, as "a territory drained by one natural system of drainage."

From what has proceeded, the reason why such a tributary drainage area cannot be regarded as "a territory drained by one natural system of drainage" should be apparent; until the ultimate outfall, at tide-water elevation, is reached, complete drainage is not accomplished; and a region which does not embrace the main stream and its tributaries to this outfall, is not such an one as is defined in the Act, and to be pointed out by the State Engineer.

Moreover, this modification of the idea of what constitutes a natural drainage district, would be exceedingly difficult to apply in practice in the Sacramento Valley; for on attempting to subdivide the valley into drainage districts, great difficulty in establishing lines of division upon any principle whatever will be found, as a study of the topography of the region will immediately convince any one. For instance, if there were well defined watershed lines between natural drainage ways, district boundaries might follow such lines. On the contrary, however, all through the valley the main streams run upon ridges, and a hollow or basin occupies the space between them. This is noticeably the case between the Feather and the Sacramento, where it would be absolutely impossible to draw a line between two districts which could be maintained upon any ground, other than that of a simple arbitrary ruling.

THE INTENT OF THE LAW.

Aside from the matter of principle involved in the rule of action laid down to govern in the designation of drainage districts, there is the intent of the law with reference to the work to be done, and the useful end to be attained, which must be subserved.

So far as the Sacramento Valley proper is concered, there could be no material subdivision of it, in the matter of forming drainage districts, without seriously affecting the working of the statute in this regard. To consider this matter, one must have a clear understanding of the objects of the measure, and these, in their turn, rest upon the necessities and possibilities in the field for its application.

Now there exists a necessity for a systematic and sustained treatment of the drains of the Sacramento Valley throughout their courses in the valley proper, in order that the evils complained of—the deterioration of the rivers as water-carrying and navigable channels, and the damage to land from the effects of the flow of mining tailings—may be corrected.

As I have endeavored to show in my report to the Legislature, the Sacramento, below the mouth of the Feather River, never can be brought back to its former comparatively useful and efficient condition (much less improved beyond that stage, as it should be), until there is a simultaneous management of the floods of the Feather and the Upper Sacramento, above that point.

And so, there can be no management of the Sacramento River below any point—the mouth of Butte Slough, for instance—without a control and improvement of that river above, to the highest point where its waters escape into the basins which flank it.

In like manner, there can be no hope of successfully treating the river as a flood-carrying channel in its upper courses, without, at the same time, improving it below, unless we deliberately relieve the higher regions by precipitating the floods upon those lower down stream. And this course would bring its own retribution; for lower obstructions will soon make themselves felt in their effects up stream, both as to silting up of beds and forcing the general spread of inundations—results destructive to the navigable and other valuable qualities of the channels.

Hence there exists a necessity for a treatment of the Sacramento River from the highest point where its floods may escape from their proper channel to the ultimate outfall at tide level in the bay.

Recognizing such necessity in this and other similar cases, the Legislature passed the *Act to promote drainage,* intending, as I believe, to provide for the construction and maintenance of works that will (1) protect property from damage likely to be occasioned by the further deposit of mining tailings in the streams, and by the movement and effect of the detritus already in their beds; that will (2) protect the river channels—particularly those which are or may readily be made navigable—from further damage; and that will (3) result in the improvement of these rivers as water-carrying and navigable streams. This intention is made apparent, not only by the evident recognition of the necessities of the case, as evidenced by the passage of the Act, taken as a whole, but by the several specifications of the scope and nature of the work contemplated, as set forth in various sections thereof.

It being the case that the Legislature contemplated, and desired such results, it would not be affording a proper opportunity for the execution of this law to make any material subdivision of the valley proper in the formation of districts; for I hold that to accomplish the results aimed at, the Sacramento River from Red Bluff or Tehama to the Suisun Bay, and the Feather River from Oroville to its mouth, should be under one control; that they must be improved as flood-carrying channels, and maintained as such under the one direction. It has been the fatal flaw in all dealings with these rivers that they have been desultory, unsystematic, piece-meal. It was the burden of my recommendation to the Legislature that this ordering of things should be remedied; and, as I understand, the *Act to promote drainage* has been passed in accordance with this recommendation, and means have been provided to carry forward the work necessary to manage the debris and improve these streams. This being the case, there can be only one district in the Sacramento Valley, and it must embrace at least all the territory in the valley and dependent upon the rivers, between the points above mentioned.

With this exception, namely—that the territory near the mouth of the Sacramento, lying between it and the San Joaquin River, and in part subjected to the influence of the floods from both rivers, or their tributaries, and not distinctly drained by either, but which has been included in the district heretofore outlined, might with propriety be set off into a district separate from either that of the Sacramento or that of the San Joaquin; for this territory, comprising several low islands, is in the common delta of the two rivers, and cannot, strictly speaking, be ranked as exclusively in the valley of either one.

AMENDING THE REPORT OF THE STATE ENGINEER.

But though any subdivision of the Sacramento Valley proper is inadmissible in the matter of forming drainage districts—that is to say, although there can be but one district in that valley, as I believe, which will fulfill the idea embodied in the law, render possible the success of the work, and thus carry out the intent of the law-making power, I am free to admit that there are parts of the valley—and more particularly are there large portions of the drainage area tributary to the Sacramento River and the valley proper—which are but remotely interested in the work to be undertaken, as compared to other portions of similar character. But from this point of view, the question of district boundaries takes a different aspect.

Should the State Drainage Commission decide that it has authority to amend my reports concerning the outlines of drainage districts, otherwise than upon the facts in each case—as to whether I have properly designated the "territory drained by one natural system of drainage," or not—then its action, presumably, will be governed by considerations of equity; and, as near as may be, those regions which, from the point of view usually taken in California, have no more interest in the success of the works contemplated than any remote part of the State, not in the drainage area, will be excluded from the drainage district.

As an engineer, in this case, I have already performed my duty under the law, by pointing out the boundaries of the Sacramento drainage area—the "territory drained by one natural system of drainage" in the Sacramento Valley. And now if the Commission decides that it will amend my report, as I have suggested it might deem proper, I will, as a member thereof, consider the other aspects of the matter, and to this end I respectfully call attention to the following points:

THE INTERESTS INVOLVED.

Aside from the general interest on the principle heretofore mentioned, which all residents and owners of property within a drainage area should have in the development and maintenance of its drainage-ways—the main river and its tributaries—certain sections of country will of course be particularly affected by the improvement of the streams as flood-carrying and navigable channels.

All of the region whose produce and supplies might be transported advantageously by water is directly interested in the improvement and maintenance of the navigable stream in its drainage area, for water carriage is the cheapest of all transportation, and is the great regulator of railway rates.

All of the area whose lands might be inundated, or whose communication might be cut off in time of flood, or which depends, for its trade, upon adjacent regions thus unfortunate, is interested in the development of a drainage system which will render possible the prevention of such overflow.

Both of these motives for immediate interest are warranted by existing facts over a large portion of the Sacramento Valley. The direct interest in the navigation of the river is even more widespread within its drainage area; and there is also the general, as well as direct, interest in the prosperity of the mining industries, which, of course, finds place in a considerable portion of the region spoken of.

The prosperity of the gravel mining interest, from the point of view of the *Act to promote drainage,* must rest upon a continuation of mining operations without resulting damage to the public streams or private property. That interest, presumably affects the mine owner, his employés, trade people, merchants, and all dependent upon them for employment or trade.

There are, then, in the Sacramento Valley and its drainage area, three great classes more directly to be affected by the result of the works contemplated under the Act mentioned:

First—Those interested in the preservation, improvement, and maintenance of the navigation of the rivers.

Second—Those interested in the prevention of widespread and prolonged inundations, or the prevention of overflow in any particular quarter.

Third—Those interested in the prosperity of the mines whose working causes damage, and in the prevention of damage to private property and public channels.

Putting out of view the primary principle embodied in the law—the idea that all within the drainage area of a river are equally interested in its preservation and improvement, except those deriving a direct substantial gain, or prevented from suffering an immediate pecuniary loss, which exceptions are provided for in the bill—we may conclude that the lines within which lie the regions interested, as above, in the navigation of the rivers, the prevention of inundations, the prosperity of mining interests, and the prevention of damage from the working of the mines, will constitute the proper boundaries for a drainage district in the Sacramento Valley.

At the outset of an endeavor to make some suggestions whereby these lines may be recognized, it may as well be admitted that it is not possible to fix upon them with any considerable degree of exactitude, except that it be attempted after a most thorough examination into the conditions and movements of trade in the valley, and be based upon a graded rule as to degree of interest. In other words, a district cannot be outlined within which it may be said that all are equally interested in the contemplated works and the results thereof. But then, can this be said of any public work? Can it be said that all parts of the State are equally interested in the prosecution of any public work for which they are taxed? Can it be said that all lands in any reclamation district have been, or can by any possibility, be equally benefited by the construction of its defensive works, or that they have been improved just to the amount of their assessment, though based upon benefits according to the judgment of some fair and skillful referee?

It is not given to human wisdom to adjust such matters without some error, and the different minds of men influenced by views from different standpoints according to local interests or mode of thought, make such discrepancies appear far more flagrant than they really are, or may perhaps actually twist the result into an apparent injustice in the direction opposite to that which it really is. And thus it is not to be expected that this duty of outlining a district to be taxed for the preservation, improvement, and maintenance of these rivers, and the disposal of mining detritus, can be performed in a manner which will be, or even, to many minds, seem to be equitable and just.

SOME PROVISIONS OF THE DRAINAGE ACT.

The *Act to promote drainage* has provided four sources of revenue from which funds are to be derived for the construction, maintenance, and management of the works contemplated and necessary:

First—A general State tax levy of "one twentieth of one per cent. on all taxable property in the State;" the revenue from which to constitute a State Drainage Construction Fund. The moneys of this fund are to be expended wherever necessary "within the drainage districts formed," so that they are presumably not to be devoted exclusively to purely local work, but are in part available for work in any other drainage district than that of the Sacramento Valley, when such other shall be formed. (See Section 24.)

Second—A district tax of "one twentieth of one per cent. on all the property in the district," the revenue from which to constitute a District Construction Fund for the district assessed. The moneys of each such fund are to be expended wherever necessary, within the district to which it belongs. (See Sections 15 and 16.)

Third—All lands *reclaimed,* as the result of the work to be carried forward under the Act, are to be assessed the value of their reclamation, to an amount not in excess of three dollars per acre, and the revenue thus obtained is to go into the Construction Fund of the district in which said lands are situated. (See Sections 21, 22, and 23.)

Fourth—The owners of "all hydraulic mines, and all mines washing earth or ores with water running into a district," are required to pay annually an assessment of "one half of one cent for each miner's inch of water of each twenty-four hours' run, used during such year," which money is to go into the Construction Fund of the district in or into which such water runs. (See Sections 19 and 20.)

All moneys raised under the provisions of the Act are to be "used exclusively for the construction of dams for impounding debris from the mines" within any district, or whose waters run into any district, "and for the improvement and ratification" [rectification,] of river channels in which said debris flows. (See Section 24.)

THE FLOW OF MINING DETRITUS—SACRAMENTO VALLEY.

Mining debris flows into the American River and is thus carried into the lower Sacramento River, and although there is not visible any considerable damage, of the character to be seen along the Bear and Yuba Rivers, to private property, from the effects of the detritus of the American, yet it has done as much, if not more, harm to the general interest of the State and of the Sacramento Valley, than that of any other stream. Its sands are about all carried into the main channel of the great navigable river of the State, and this channel is being rapidly destroyed, to the detriment of the State at large, the whole Sacramento Valley more particularly, and at loss to the owners of low lands and property in that valley and along the river, which are rendered more difficult of reclamation and protection.

Northward from the American River, on the east side of the valley, all of the principal streams as far as Chico Creek, bring mining detritus from the mountains, in quantities readily appreciable, and most of them spread a large portion of their sediments over lands adjacent to their several courses. Thus, where the greatest show of damage is apparent, the least real harm may have been done to the general interest of the State and of the valley at large; for although the destruction of a few thousand acres of fine farming land may be a death blow to the fortunes of the individual owners thereof, and an indirect loss to the community, it is as nothing for the State and valley at large to consider, when compared to the destruction of the Sacramento and Feather Rivers as navigable and flood-carrying channels. I make these remarks to emphasize the mention made of the influence of the American River detritus, which, though less apparent to the casual observer than that of the Yuba or Bear, is in reality of equal, if not greater, moment than that of either of the other streams, so far as public welfare is concerned; for while a large part of the Yuba and Bear River sands have found and still do find a resting place upon the plains and bottom lands, about all of the American River detritus is forced into the main river of the valley, at a most important point in its course.

The streams from Chico Creek northward to the Sacramento River do not, so far as I am informed, transport any mining detritus.

The Sacramento River brings sands and slums from the mines of Shasta County, in small quantity to be sure, as compared with that transported by the waters of many other streams entering the valley, but still in amounts sufficient to discolor the waters much more than they formerly were, as I am informed, and the amount of sand which is rolled along the bottom of the stream at time of flood may be very great.

THE INTEREST IN NAVIGATION.

Concerning the scope of country interested in the preservation and improvement of the rivers of the State, and more particularly those of the Sacramento Valley, I beg leave to call your attention to the following extracts from the report of the Honorable B. F. Tuttle, Commissioner of Transportation, for the years 1877 and 1878. At page 49, under the heading of "Navigable Waters in California and their Influence on Rates of Transportation," Mr Tuttle says:

"Fortunately for this State, nature has been more liberal in providing water-ways for the free use of our people, for transportation purposes, than in many other portions of our common country. Following are some statistics of the tonnage which is employed upon the inland navigable waters and in the coast trade, which will serve to show what influences operate to keep the cost of transporting the products of the agricultural portion of the State to market at low rates. Moreover, they will also show that private capital has not hesitated to seek investment in that species of property. Such being the fact, the State cannot be to careful in guarding against the obstruction of its great water-ways, and every legitimate effort should be made not only to preserve but also to improve their navigation, as the sure and safe method of protecting her producers from high rates for transportation. * * * A judicious system of improvement of the inland waters of this State would do more to keep the cost of transporting its products to market at low rates, than scores of penal enactments and inflexible tariffs for the regulation of charges by transportation companies. The favored location of most of our agricultural and timber lands renders extortionate rates impossible, if the navigable waters of the State are cared for as their importance warrants.

"The following places on the California Pacific Railroad, from their proximity to navigable waters, are enabled to ship their freights at rates fixed by the cost of water transportation: Napa, Suscol, Vallejo, Benicia, Bridgeport, Suisun, Elmira, Batavia, and Dixon.

"The Northern Railway, located on the west side of the Sacramento River, and completed as far up as Willows, competes for the business at the following places located on the river: Knight's Landing, Elk Horn, Monument, Bostwick's Ranch, Smith's Ferry, Three Rivers, Colgrove's, Poker Bend, Mosquito Ranch, George Howell's, Big Orchard, Minis Ranch, Big Eddy, Dry Slough, Budd's Ranch, James Powell's, Nordyke's, Perdew's, Eddy's, Grimes', James Wilson's, Twenty-mile Bar, Grand Island Mill, Sycamore, Meridian, Moore's Ferry, Butte Creek, Colusa, Sherman's, Randall's, Reynolds', Nine-mile House, Manhattan, Boggs', Princeton, Butte City, Call's Ranch, and other points on sloughs leading off from the river.

"The tariff on the Central Pacific system is influenced by the Sacramento River, above Jacinto, at Hite's, Parrott's, Dayton, Monroeville, Reade's Landing, Chico, Bidwell's, Walsh's, and other points as far north as Red Bluff, and as far south as Firebaugh's Ferry in the San Joaquin Valley, including Hill's Ferry, Salt Slough, Grayson, San Joaquin City, Point of Timber, Antioch, New York, Pittsburg, Pacheco, Martinez, and other points down to Oakland and south to San José. On the Northern Division of the Southern Pacific Railroad similar examples might be given."

According to this report, the river steamers, sixty in number, in constant or occasional use on these waters, have a total tonnage of ten thousand nine hundred and ninety tons, and the forty barges, ten thousand six hundred and seventy-three tons.

At page 54, I find, after certain tabular statistics, of which the above is a summary, so far as they apply to river steamers and barges, the following:

"It will be seen, by the foregoing, that the water-craft engaged on our inland waters and along the coast comprises a very important part of the total of the transportation facilities of the State.

"As a rule, no railroad can supersede transportation by water, unless it can perform the like service more cheaply and advantageously; and when this happens, it follows that the shipper reaps the benefit. No one at this time would advocate a statutory prohibition of competition, although that is not wholly free from irritation, by producing 'discrimination.'

"It has been suggested and recommended that competition in this State be fostered, even by the establishment and maintenance of river and ocean lines of steamers, with rates fixed by the State, and that State aid be given to maintain such rates when not remunerative."

At page 58, under the head of "Railroad Monopoly," the Honorable Commissioner sets forth very clearly the value of the navigable streams to the State at large, and more particularly to the Sacramento and San Joaquin Valleys, in the following words:

"In this State, with few exceptions, one single corporation has undertaken to supply railroad facilities for the whole people. In doing this, lines of railroad have been projected and constructed through districts of country offering few inducements for profitable traffic. These lines traverse the principal valleys through which run, also, the two great watercourses of the State. They also skirt the great bays and estuaries leading into rich interior valleys. Bordering upon and adjacent to these inland water-ways, extending back for a distance of from five to fifteen miles, lies the greater part of the productive portion of California. The same may also be said of the agricultural land along the coast, the products of which find their way to market upon the ocean. Upon these water-ways ply every species of steam and sail craft adapted to their navigation, and it is not an overestimate to say that three fourths of the agricultural and nine tenths of the forest products reach the markets independent of the railroads; or, in other words, the rates for transporting them are determined by the facilities afforded by these means of transportation.

"If these water facilities did not exist, the railroads would indeed have a perfect monopoly of the carrying trade. With these agencies, however, effectively preserved, offering as they do opportunities for profitable traffic to the water-craft so far as the carriage of the products of the soil to the general markets and of supplies to the interior is concerned, there is not much to fear from railroad monopoly."

To illustrate the effect on local railroad rates of water competition on our navigable rivers, the following example is given at page 61 of the Commissioner's report:

"To illustrate this subject, take a special case: San Francisco and Sacramento are connected by navigable waters, and in the exchange of commodities between the two cities they have always the benefit of cheap transportation. A railroad one hundred and fifty-one miles in length connects them, and passing through a number of interior towns heretofore having imperfect inter-communication. By rail one of these places (we will call it Galt), is located twenty-seven miles from Sacramento and one hundred and twenty-four miles from San Francisco. How has it been affected by the construction of the road? Before its construction, freight from San Francisco destined for Galt was shipped to Sacramento by water, thence by wagon to Galt. Since the completion of the road, there are two routes to Galt from San Francisco—one by rail direct, the other by water navigation to Sacramento, thence by rail. Taking the water route, the rate for shipping to Galt is found, by adding to the water rate from San Francisco to Sacramento, the rail rate from Sacramento to Galt. The latter rate is much below the former rate charged by wagon, and to the extent of this difference the shipper at Galt has been benefited by the building of the road, not to mention the greater convenience and saving in time, of which he now receives the benefit.

"There would be no complaint if the road terminated at Galt, but a new route having been opened to Galt direct from San Francisco, one hundred and twenty-four miles, gives rise to all the trouble. The railroad is obliged to carry freight from San Francisco to Sacramento via Galt at the low water rate, which is below the average cost of railroad transportation; but if it derives a small profit from this source, it is enabled to make a reduction in rates between San Francisco and Galt direct, and between Sacramento and Galt. It is obliged, however, to charge the shipper at Galt more per ton per mile for the distance of one hundred and twenty-four miles, than is charged per ton per mile to Sacramento, but the total charge can in no case exceed the sum of the water and rail rate from San Francisco to Galt via Sacramento, else the latter would be the preferred route. It cannot be contended that it is unjust to the shipper at Galt because he is charged more proportionately than the shipper at Sacramento, who always had the benefit of the water rate. To do so would be to compel common carriers to expend their money in overcoming natural obstacles, and in placing the benefits arising therefrom at the disposal of those less favorably situated.

"Railroads cannot successfully compete in the transportation of freights with carriers on navigable waters. The principal element utilized by the latter costs them nothing, while the former is compelled to make a heavy expenditure before he can move a bale of goods."

And still again, at page 75, Mr. Tuttle has, in conclusion, summed up his estimate of the importance of these navigable streams as follows:

"The statistics relative to our inland commerce, hereinbefore presented, will serve to demonstrate the urgent necessity in the interest of commerce, as well as of nearly all other industrial pursuits, of preserving and improving the navigable waters of the State. This is a subject which the Legislature can take cognizance of, and the attention of that department of the government is directed to its consideration.

GENERAL DEDUCTIONS.

"*First*—The competition, based upon transportation by water, constitutes a controlling factor in regulating railroad rates on freight, and it should be given free scope.

"*Second*—It is of the gravest importance that the extensive water-ways of the State should be kept open for the public use; and their improvement demands governmental care and supervision."

MODIFICATION OF REPORT SUGGESTED.

I shall not attempt to designate the exact limits to which the Sacramento Drainage District should reach in view of the considerations just mentioned, but rather to make certain illustrations of the modifications of the district bounds from the limits of the natural drainage area, which may with propriety be made in case the Commission decides to be governed in its action by what may appear to be a more equitable distribution of the burdens of taxation than could be effected by embracing the whole watershed area within the district.

In the first place, I suppose it will be admitted without question, that all lands and property threatened with overflow, or which have their communications occasionally cut off through being surrounded by overflowed tracts, all marginal river lands, low basin lands, tule swamps and islands in the Sacramento Valley, are interested in the preservation and improvement of the Sacramento and Feather Rivers as flood-carrying channels. For although the work of improvement of these channels may not result in the complete reclamation of or immunity from danger to any particular piece of property which may be considered, yet the development of the flood-carrying capacity of the great drains of the district will, without doubt, benefit property so situated, and render its reclamation or protection a possible and far less expensive work. I consider, therefore, that all such property in this valley may well find place in the district.

It has been said by the honorable Commissioner of Transportation, already quoted, that the river navigation now controls the rates of freight on the railroads in Sacramento Valley as far northward as Red Bluff, yet the river is navigable in its present condition only to a point thirty-three miles, in a straight line, south of the town mentioned, and from this point, even with the river in its present condition, during the grain shipping season not more than a third of a load can be brought away on the barges, and a full load cannot be carried at the season of greatest traffic until a point is reached well below where the flood waters first escape from the channel into the east basin below Chico Creek.

With some improvement in this upper part of the river, therefore, it would seem that its navigation would be a boon to about the whole of Tehama County, but that the lands and property beyond in Shasta or Lassen Counties would not receive any material benefit from such improvement. Hence, if it should appear that there is no necessity for including any portion of the last mentioned counties, on account of the mining going on there, they might well be left out of the district.

The Clear Lake and Cache Creek mountain watersheds on the west, and a large portion of that of Putah Creek, are beyond the limits of the influence of the Sacramento River on their traffic rates, and either find a business outlet over the mountains into Napa Valley, or by a route independent of the river and not in competition with it, direct to the Suisun or San Pablo Bays. A portion of the plains west of the Yolo basin, in Solano County, and within the limits of the Sacramento drainage area, as heretofore outlined, is also not within the limits of the influence of the river navigation on its freight transportation rates.

Hence, it would seem that these regions too, might with propriety be left out of the district, and then a line would have to be struck west of the Yolo basin through Solano and Yolo Counties, keeping away from the river at the limit of the influence of its navigation on transportation rates.

With respect to the region directly interested in the prosperity of the mines which occasion the damage sought to be averted, I simply remark that my studies and observations have not revealed any principle upon which any portion of the mining counties, along the east side of the Sacramento Valley whose waters shed to the west, can be left out from the district.

Though an extended study in detail might possibly show some considerable sections of country which could be segregated as being independent of mining of the character whose life it is sought to prolong, yet it must be remembered that the counties referred to are all mining counties, all largely dependent upon hydraulic mining, and, from the point of view of the *Act to promote drainage*, all largely interested, as counties, in the result of the work contemplated under it—

the success of the work of disposing of the detritus so as to quiet the complaints against mining operations.

CONCLUSION.

I have now submitted a report embodying the results of my special examinations, concerning the establishment of drainage districts, up to date; have recommended the formation of one such district in the Sacramento Valley, as defined in the law by which I am governed; and have pointed out, in a general way, how the district, as outlined by the natural drainage basin of the Sacramento and its tributaries, may well be modified in its extent according to certain equitable considerations which the State Drainage Commission may consider, but which the State Engineer could not take into account, as against the rule laid down specially for his guidance in the statute.

It should be borne in mind that this is a report to date, only, on the subject of establishing drainage districts, and that as occasion requires, other districts may be designated. It will be a subject for further inquiry as to whether or not a necessity exists elsewhere in the State for the operation of this law, and just what territory should constitute a district in each case where the necessity does exist.

Very respectfully submitted.

WM. HAM. HALL,
State Engineer.

Office of the State Engineer, Sacramento, May 26, 1880.

ACTION OF THE STATE BOARD.

On the twenty-eighth day of May the State Board of Drainage Commissioners considered my report, and action was taken upon it, as shown by the following copy of the minutes of the meeting of that day:

Record of the proceedings of the State Board of Drainage Commissioners, in the matter of organizing Drainage District Number One.

Sacramento, California,
Friday, May 28, 1880, 10 o'clock a. m.

"The Board of Drainage Commissioners met at the office of the State Engineer, pursuant to adjournment.

"Governor George C. Perkins, President, in the chair. Present—J. W. Shanklin, Surveyor-General; William H. Hall, State Engineer; George B. Cosby, Secretary. The minutes of the previous meeting were read and approved. The report of the State Engineer as to drainage and formation of drainage districts, including the territory drained by the Sacramento River and its tributaries, final consideration of which was postponed from May 27th, was again taken up, considered, and on motion of J. W. Shanklin, Surveyor-General, was unanimously amended, so as to exclude from the boundaries of the drainage district, by him, the said State Engineer, recommended to be formed, all the territory therein described, save and except that included in the following description; whereupon it was, upon motion of J. W. Shanklin, Surveyor-General, unanimously resolved, as follows:

"That, whereas, under and pursuant to an Act of the Legislature of the State of California, entitled 'An Act to promote drainage,' approved April 23, 1880, the State Engineer has presented a report containing the result of his investigations, as to drainage, to date, as in said Act provided, and has recommended the formation of a drainage district, comprising the territory drained by the Sacramento River and its tributaries;

"And, whereas, the boundaries of the district so recommended to be formed have been amended, altered, and changed so as to read and include the territory hereinafter described; now, therefore, it is hereby

Resolved, That the report of Wm. H. Hall, State Engineer, recommending the formation of a drainage district of that portion of the State of California as described in said report, and amended by this Board as to the boundaries thereof, be and the same is hereby approved and adopted as amended; and that portion of the territory of the State of California hereinafter described, being the territory described in said report as amended by this Board, is hereby declared to be and the same is hereby formed into a drainage district, to be known and designated as Drainage District Number One.

"The land and territory hereby declared as Drainage District Number One (1), is described as follows, viz.:

"Commencing on the south line of section one of township four north, range two east, Mount Diablo base and meridian, at the quarter section corner in the County of Solano, being the point of intersection between the State line of segregation as finally adopted, and the westerly boundary of the Rancho de Los Ulpinos; thence following said segregation line to the boundary between Solano and Yolo Counties; thence following said county boundary line between the two counties to the corner common to Solano, Yolo, and Napa Counties; thence following the boundary line between Yolo and Napa Counties, and the boundary line between Yolo and Lake counties, to the corner Common to Lake, Yolo, and Colusa Counties; thence following the boundary line between Colusa and Lake Counties, and the boundary line between Mendocino and Tehama Counties, and the boundary line between Tehama and Trinity Counties, to the corner common to Tehama, Trinity, and Shasta Counties; thence following the boundary line between Tehama and Shasta Counties, to the corner common to Tehama, Shasta, and Plumas Counties; thence following the dividing ridge or watershed line between the drainage area of the Sacramento Valley and the drainage area of the great basin of Nevada in an easterly and southerly direction to the intersection of said ridge line, with the ridge which divides the basin of the American River from the basin of the Mokelumne River; thence following said last mentioned ridge in a westerly direction to the head of the ridge which divides the basin of the American from the basin of the Cosumnes River; thence following said last mentioned ridge line to the point of its intersection with the State line of segregation as finally adopted on the east side of the Sacramento River; thence following said line of segregation to the Cosumnes River; thence down that river to its junction with the Mokelumne River; thence down that river and its west fork to Snodgrass Slough; thence along said slough to its junction with Tyler Slough, and along that Slough to Georgiana Slough; thence along Georgiana Slough to its junction with the Old River channel of the Sacramento River; thence down Old River channel to its junction with Steamboat Slough; thence west to the west bank of the Sacramento River; thence along the westerly bank of the Sacramento River to a point on the Rancho de Los Ulpinos, where the high land extends to the river bank; thence following the line of separation between the high and low land to the point of beginning.

"All of which territory, included in the description aforesaid, is hereby declared to be, and is, and shall be a drainage district, to be known and designated as Drainage District Number One.

"J. W. Shanklin, Surveyor-General, moved that the report of the State Engineer, Wm. H. Hall, be spread, as received by this Board, upon the minutes of this meeting, and that the minutes, including the foregoing amendment to the report of the State Engineer, be printed.

"It was so ordered by the Board.

"The Board of Drainage Commissioners then adjourned, to meet at the call of the President.

"GEORGE C. PERKINS, President.

"G. B. Cosby, Secretary."

DRAINAGE DISTRICT NUMBER ONE.

Drainage District Number One, being thus formed and organized, it devolved upon the State Engineer to recommend plans for the works contemplated, and necessary to carry out the provisions of the law.

Accordingly general recommendations were made to the Board of Directors of the district in a report dated June twenty-fifth, on drainage works for the district, and a report dated July sixth, on dams for the storage of mining detritus.

The views expressed in these papers were adopted by the Board, and I was requested to prepare plans for certain works which it was thought necessary to commence at as early a day as possible.

A memorandum, or schedule of works, was also prepared by me to serve as a guide in consultation, and was submitted to Mr. James B. Eads and Colonel G. H. Mendell, consulting engineers, and has received their indorsement as a proper outline of treatment and works for the main river works for the district.

The reports spoken of, as addressed officially to the Board of Directors of the district, I understand have been submitted to you in their report transmitted by the Governor. The memorandum of works is now presented as embodying the clearest idea I can impart of the ultimate objects aimed at, and the general treatment of the river problems, of which the works, afterwards to be described, are the detail structures.

MEMORANDUM

CONCERNING THE IMPROVEMENT OF THE SACRAMENTO RIVER.

Submitted to Messrs. James B. Eads and George H. Mendell, Consulting Engineers, in August, 1880, and approved by them.

The improvement of the Sacramento River as a flood-carrying and navigable channel, is to be effected mainly through the agency of the moving power of its currents, guided and controlled by engineering works to be designed and executed for this purpose.

These works will have for their ultimate objects: First, the production of a channel of good regimen—uniform capacity to transport the waters presented; second, the maintenance of a well formed, self-sustaining, low water channel; and third, the production of a high water channel of sufficient capacity to accommodate and transmit the water of all ordinary floods.

Although material may be taken to advantage from the bed of the river for the purpose of constructing levees upon its banks, thereby enlarging its channel, yet the great work of removing its shoals, adjusting its widths and depths, and generally clearing its waterway, must be performed by the moving water—for to talk of accomplishing this end by direct mechanical means, artificially applied, is to contemplate the expenditure of money beyond all hope of reasonable return. Hence, we are to consider the character and moving power of the river currents.

The Sacramento River may be divided for study into three compartments, as regards the power and action of its currents to produce and maintain the channel desired. These are, the tidal compartment wherein the influence of tidal action predominates over that of the flow from land drainage in the aggregate and throughout the year, and regulates the dimensions of the channel; the land drainage compartment—wherein the channel is formed and alone maintained by the waters of land drainage, and the influence of tides is not felt; and the intermediate compartment—wherein the balance between the waters brought down from above and those periodically sent up by the tides, is most variable, and the channel is made and maintained in part by each influence—the one predominating at the time of floods, and the other at times of low water.

The lower or tidal compartment of the Sacramento River may be with greatest apparent propriety taken as extending up to the mouth of Cache Slough, on the Steamboat Slough channel, and to a somewhat greater distance above the foot of Grand Island on the Old River channel; but for convenience of reference, and to conform to the divisions of the river mentioned preliminarily in the report of the State Engineer made to the Legislature in January, 1880, I propose to regard only the channel below the foot of Grand Island to the bay, as constituting this tidal compartment. Thus including within it the eighth and ninth divisions of the river, preliminarily set out as above mentioned.

The influence of the tides used to be felt at low water stages of the stream as far up as the mouth of Feather River, but since the rising of bed, occasioned by the flow of sands in the past few years, the tidal influence is not perceptible above the mouth of the American River, where formerly there was two feet of tidal action. A successful treatment of this river for the improvement of its channel would result in the lowering of the water plane, and the restoration of tidal action as far up as of old; so that ultimately the intermediate compartment would extend to the mouth of Feather River; but for the purposes of preliminary work, the limit of present tidal influence at low water is taken as the upper line of this compartment, so that it is considered as extending from the foot of Grand Island to the mouth of American River, including the sixth and seventh divisions of the river, as set out in the report heretofore referred to.

Above the mouth of the American River the channels of the Sacramento and Feather Rivers are now maintained by the action of waters moving forward to the bay continuously—the waters of land drainage. The action of the tides is not felt, and their conservative influence cannot be counted upon to any great extent for restoring the channel to its former depth and improving upon its condition generally. Here, then, is the upper or land drainage compartment of the river.

IMPROVEMENT—TIDAL COMPARTMENT.

In a general way the influence of the tides was discussed in the report to the Legislature heretofore alluded to. (Part II, pp. 59–63.)

This influence is to be availed of in the tidal compartment by the removal of channel bars; thus facilitating the propagation of the tidal wave—for the velocity of its transmission is in proportion to the square root of the mean depth of the channel.

These bars exist at points where the river is widest—too wide for the volume of water habitually presented to it—and are to be removed by bringing the banks to the distance apart which shall be indicated by a study of the hydrography of this compartment, as that which affords the average well shaped section.

At one notable point—in the turn known as "Horse Shoe Bend"—five thousand feet above Emmaton Landing, and at several other points also, the channel in this compartment is too narrow, as the result of an undue growth of a point bar, and the opposite bank is being destroyed. This is an action of another character requiring attention.

By reference to page 66, of Part II, of the report spoken of, it will be seen, under the head of *Works advisable on the lower river*, *Second*, that all of the foregoing line of improvements has been officially recommended in the following words:

"Removing the channel bars between Grand Island and Collinsville, and widening the channel in the Horse Shoe Bend."

It is to be remembered, that in contracting the width of the channel above low tide low water mark, the area of the spread of tidal waters is restricted, and the volume of the tidal wave thereby diminished; a result which will tend, in a degree at least, to counteract the influence for good of adjusting the width of the channel. And yet to adjust those widths only up to the low tide low water mark, would admit of too free an escape for the waters over the full width of the bars at higher stages to insure the maintenance of the desired channel through them.

Bearing these points in mind, we are to bring the channel to the required width up to an elevation which will insure the conservative action necessary, and plan for the spread of the tidal waters over as great an area as possible above that level. With this view, my study of the subject leads me to adopt about the plane of half tide at low water stage for the crest elevation of all contracting works in the tidal compartment of the river.

For a similar reason, if for no other, Cache Slough should be left open. It acts as an important basin into which the wave of tidal water is poured and withdrawn twice daily; thus affording the volume necessary to keep open the channel of the river below, by its passing up and down again.

The chief works considered necessary in this lower or tidal compartment of the river have been indicated on page fifty-six of the report heretofore alluded to, under the side heading, *Proposed channel corrections.* I here restate them in a more comprehensive form.

The Newtown Shoal Correction.

A new alignment for the south shore of the river, above Wood Island, to near the foot of Grand Island:

Designed to effect the removal of the Newtown shoal and the enlargement of the Rio Vista channel.

General plan: a permeable training wall of brush in the form of a mattress on edge supported by piles, near the alignment of the proposed new shore, connected with the present south shore by several cross walls, or spurs of similar construction.

The effect will be to narrow the river upon the shoal and close the channel south of Wood Island with the permeable barriers, thus causing deposit upon the south half of the shoal, and in the south or Wood Island channel, and scour through the north half of the shoal and the northern or Rio Vista channel.

Corrections from Rio Vista to Collinsville

Effect the production of a channel through all the shoals from Wood Island to the bay, to the normal width and depth of the present channel, as found at the localities of the same division of the river where it is in good form.

General plan: A treatment of the wide shoal reaches of the river, somewhat similar to that proposed for the Newtown shoal correction, namely, the introduction of permeable barriers or spur dykes, located upon such portions of the flats as will leave clear the best alignment for the permanent channel. These barriers may be constructed as floating walls or curtains of brush, anchored at their lower and buoyed at their upper edges, in a manner somewhat similar to those used on the Missouri. The effect will be to cause deposit between the successive dykes along the same shore, and erosion in the channel between them and the opposite bank, thus effecting the production of a channel of the desired width and depth.

Horse-shoe Bend Correction.

The general idea of this correction has been considered in a former mention of it.

A point bar has grown rapidly and become covered with swamp vegetation. The high water currents are thrown forcibly against the opposite bank, which is but the narrow rim of bank land forming the northern border of Sherman Island. This rim is being rapidly destroyed. It is proposed to divert the current from its present point of attack, and cause it to cut away the opposite bar.

The means of accomplishing this may be briefly designated, as a series of spur dykes thrown out from the concave shore, commencing well above the present point of caving, and extending down to and over it.

These spurs will be for the most part permeable, constructed of piles and brush wood, and designed to check the force of the current all along the south or Sherman Island shore, and deflect it to the opposite bank.

It is believed that, as the result of the execution of the foregoing works, the river throughout its lower or tidal compartment will be brought to a good regimen; the tidal flow will be facilitated, the volume of tidal water augmented, and the whole channel will be rendered more efficient, as a line of flood escape through this compartment. And furthermore, it is maintained that the accomplishment of this object is essential to the successful treatment of the river above for the enlargement of its capacity.

IMPROVEMENT—INTERMEDIATE COMPARTMENT.

In this compartment we have the tidal action, in a diminished degree, and the flow of land drainage on sufficiently inclined slopes, to induce great scouring power, as our agent for the improvement of the channel.

As already remarked, our first object is to secure a channel of good regimen. In this compartment exists the most serious defect in the regimen of the river in any portion of its course—the division of its waters into two channels, which occurs at Grand Island.

Correction at Grand Island.

It is proposed to correct this defect by making Steamboat Slough the channel of the river, and closing Old River channel at its head. This proposition is discussed at page fifty-six to fifty-nine of the report heretofore mentioned.

Steamboat Slough is to be preferred to Old River as the main channel, for the following reasons:

First—It is so much the shortest, that a material lowering of the flood-line would be effected, on this account, at the head of Grand Island and above, by its successful improvement.

Second—It is the most direct, and can be developed so as to have less bend resistance than Old River channel.

Third—It is equally as good a channel, for the lower two thirds of its length, and a better channel at its lower end than Old River.

Fourth—It is only leveed on one side, and the land is regarded as in a measure reclaimed only on that side, so there is room for widening it and setting the levee on the other side far enough back to afford the necessary waterway; whereas Old River is already leveed on both sides, and the embankments as far apart as they can be put—not affording sufficient waterway between them for the floods—so that the improvement of this channel would necessitate a large outlay for property damage and the destruction of at least one of the existing levees.

Fifth—The Old River is already a tolerably clear channel, with a connection through to the Mokelumne and San Joaquin Rivers, by way of Georgiana Slough, which would admit of tidal circulation; and hence, if it were closed at its upper end, and the sands thus prevented from entering there, it would remain open as a navigable stream, affording boating facilities for the traffic from its bank lands to the bay; whereas the closure of Steamboat Slough at its head—in its present condition, and there not being a circulation of tidal water through it—would result in its complete destruction as a navigable channel, to the detriment of lands along its borders.

Sixth—Cache Slough, which, as before pointed out, is an important tributary, as draining the Yolo Basin, enters Steamboat Slough channel, and materially aids in clearing it at its lower end, while it has just the reverse effect upon the Old River channel, as our studies of the tides and soundings reveal.

It is proposed to close the head of Old River gradually, by means of brush mattress sills, laid in during successive seasons, one on top of the other, until a dam is formed, the whole to be held in position by piles and weighted down with stone.

In the meantime Steamboat Slough must be improved by opening a new head to it, and dredging through a deep channel to start the scouring action, training its currents to cut off the points, straighten it, and to wash out its bars.

The material obtained by the dredging operations, to be used in raising and strengthening the existing levee and constructing one to correspond with it on the north bank.

As the forcing of Steamboat Slough channel will cause a temporary super-elevation of the flood-line of the river above, all levees must be raised and strengthened to meet this, as far as Sacramento at least, before this work is commenced.

Closure of Sutter Slough.

For the same reasons as have been given in the case of closing Old River, Sutter Slough should be closed at its upper end, and the process will be similar to that just described for the former channel, only the time required need not be more than one season, seeing that this is a small opening.

IMPROVEMENT—MIDDLE COMPARTMENT ABOVE GRAND ISLAND, AND THE UPPER COMPARTMENT.

All works necessary above Grand Island, throughout that portion of the river affected by the tides, and that above it also, may be generally classified together, as follows:

1. Removal of channel bars.
2. Protection and alignment of banks.
3. Straightening the channel.
4. Closure of crevasses and other outlets.
5. Leveeing.
6. Provision of high-flood overflow channels.

Removal of Channel Bars.

Between Grand Island and the mouth of Feather River there are two notable channel bars, and one other shoal but little less marked in its development. Haycock Shoal and Six-mile Shoal, the one about nine miles below Sacramento, and the other about five miles above, being the first two of the three in importance, while the bar just above the old Russian Crossing, known as Ten-mile Shoal, is to be ranked next. Two other shallow reaches exist in this portion of the river, but it is to be hoped the general improvement would result in the establishment and maintenance at these points of a channel even in width and depth with that above and below, which would admit free transit of the sands forward, and of the general deepening of the whole stream, without any special works, such as will be needed at the three bars first mentioned.

All bad channel bars are to be removed by training the current over them in a channel of even width with the normal width of the stream in the division where situated. This is to be effected by brush training walls and spur dykes, or even by lighter works of brush, like those used on the Missouri River.

Above the junction of the Feather and the Sacramento, on the Sacramento particularly, above Colusa, there are a number of points where this treatment must ultimately be applied; but none so necessary as those before mentioned, or so prominent as to deserve special mention above others at this time.

Correction and Alignment of Banks.

Where the river banks are being rapidly worn away locally, the action must be arrested, unless it be where a widening of the stream or a change of alignment is desirable in the direction towards which the change tends; and in cases where the trend of the banks is such as to cause notable eddies and point bars, the cause of these should be removed by effecting a change in the alignment of the banks.

Two notable places of some extent exist on the Sacramento, between the mouth of Feather River and the head of Grand Island, where the banks must be protected; namely, the west bank from the American River to near the Sacramento and Yolo bridge; and the west bank in the turn at the point known as Chicory Ranch, five miles below Sacramento.

At the first mentioned point the shore line has receded three to four hundred feet for about a quarter of a mile in distance, during the past ten years, and this movement appears to be increasing in rapidity.

At the last mentioned place a similar action has commenced with alarming rapidity within the past few years, threatening the destruction of the bank of the river back into the low ground in the near future.

Spur dykes in series, and of a more substantial character than those proposed for effecting the corrections at channel bars, should be used for this work. Brush mattress foundations, with piles driven through these for supports, and filled in with brushwork between, constitute the leading characteristics of the proposed spurs for this last mentioned purpose.

Within the portion of the river now under consideration there are two points where the banks should be given a new alignment, for other causes than heretofore localized. These points are at and below the mouth of the American River, on the east side, and on both sides in the bend at Bryte's ranch.

The American River mouth correction will be planned to give its waters an entrance into those of the Sacramento more nearly parallel to the direction of the larger stream.

The object to be effected by means of a pair of training walls and spur dykes connecting them with the banks. The effect will be to facilitate the flow of flood waters, lessen the bank caving on the opposite shore of the Sacramento, heretofore alluded to, and prevent to a great extent the formation of the bar on the east shore of the Sacramento below the American mouth. The proposed work would be in style of construction somewhat similar to that projected for the heavier spurs to protect caving banks.

On the Upper Sacramento River, particularly above Colusa, a number of places exist where the banks must be protected from abrasion, but none demand special mention now, except that at the Town of Colusa, where works similar to those spoken of for the west bank of the river at the two points below, must soon be undertaken to prevent a serious malformation of the river channel, and consequent interruption of the escape of floods. On the Feather River a similar notable point exists, besides others of minor importance, in what is known as Shanghai Bend, three miles below the mouth of the Yuba, and this trouble should also receive attention at an early day.

Straightening the River.

Except in the Steamboat Slough correction—that at Grand Island already mentioned—the expedient of straightening the river is desirable only in the divisions between the head of Butte Slough and the mouth of Feather River (see pages 67 to 72 of report to Legislature).

It is proposed to make at least six cut-offs in the river in this region—three below Knight's Landing and three above—as shown by the accompanying drawings.

Closure of Crevasses and other Outlets—Levee Construction.

(1) Numerous deep cuts or crevasses in the natural banks, for the most part caused by the ruptures of the levees and consequent rush of waters through narrow openings, exist on both the Sacramento and Feather Rivers; (2) long stretches of these streams are flanked by such poor levees, or none at all, that flood waters escape in thin sheets over the land for comparatively long distances, without destroying the banks to any considerable depth; and (3) a number of old natural channels, generally termed sloughs, which have either never been closed or have been swept open again by the floods, still permit the escape of the floods into the basins which flank the rivers.

These are all outlets, at times, and some of them serve as inlets for the return of waters at other times; but at all times of flood they disturb the regimen of the rivers, and their continued action will defeat any attempt to improve its channel; hence they must be closed.

The prevention of the escape of any large portion of the waters, suddenly effected, will result in a material temporary elevation of the flood-line in the river, in the neighborhood of the closures particularly, until such time as the channel becomes readjusted to the duty it has to perform. Hence, the entire closure of any considerable proportion of the existing outlets in any one locality in one season would be attended with disaster to existing levees in the neighborhood, and along the river below also.

It is proposed, therefore, to effect the closure of these outlets by degrees. The smaller deep ones should be completely closed at once, by extending the levees across them; the larger deep ones could at the same time be filled to the natural bank elevation with brush dams placed around behind them, and be made to serve as high-flood easements for a few seasons, during which they could be gradually closed by raising the brush dams from time to time; and pending the closure of these larger crevasses and natural outlets, the levee system should be made complete and perfect.

In all cases the outlets which permit the escape of water into the heads or upper ends of the basins, should be closed before those at the lower ends, and the closing dams in those latter should be provided with flood-gates proportioned to the probable duty to be performed by them as drainage outlets from the basins.

With this opinion, I am in favor of completely closing all minor openings where levees exist up to them, and partially closing all the larger openings as described up to bank level, as soon as the work can be accomplished, and at the same time constructing complete levees so as to prevent the escape of all waters except as follows:

For the first year, above Colusa, on the east side of the river, provision should be made for the escape of twenty thousand cubic feet of water per second at some points where it now escapes, when the Red Bluff gauge reads at high water elevation of eighteen hundred and eighty.

Below Colusa, on the east side, down to Butte Slough, inclusive, provision should be made for the escape of fifteen thousand cubic feet of water per second when the Colusa gauge reads flood elevation of eighteen hundred and eighty.

Below the mouth of Feather River, on the west side, and above Sacramento, provision should be made for the escape of thirty thousand cubic feet of water per second when the Fremont gauge reads at high water elevation of eighteen hundred and eighty.

With these provisions for easement, the existing channels, leveed systematically and uniformly to a moderate and safe height for levees, would carry away the ordinary floods of the valley, and the work of rectifying and enlarging them as heretofore recommended, would be in continual progress, so that after the third or fourth season, including the present as one—the cut-offs being effected in the middle river, and the Steamboat Slough rectification being accomplished on the lower river, all outlets could be safely closed to high-flood mark of eighteen hundred and eighty, and the levee system could be perfected for all ordinary floods of the valley.

I am opposed to the radical immediate closure of the principal outlets, such as the English break, and two or three others on the same side of the river above it, and Butte Slough, and several others on the same side of the river above it, because I am certain that the river, in its present condition, will not carry the waters which would be sent down to it, within levees of reasonable height, below these points, and the result would be disastrous.

Flood Escape Weirs.

For a similar reason I am in favor of providing points of escape for the surplus waters of extraordinarily high floods. Such vast volumes of water as would overtop any line of levees which will ever be constructed in this valley will assuredly be brought down occasionally.

No possible artificial embankments, no possible development of the channel of the Sacramento River, would provide waterway for, and prevent the spread of the waters of such floods as those of 1853, 1862, 1868, and perhaps others of which we have record.

The Sacramento River now carries eighty thousand to ninety thousand cubic feet per second past Sacramento. We may make it carry two hundred thousand cubic feet, but we cannot make it carry four hundred thousand cubic feet; and I am of the opinion that the flood of 1862, or either of the others mentioned, perhaps, would have presented the last amount named, in the lower river.

For this reason I am in favor of providing, on the west bank of the river, between Sacramento and Knight's Landing, large escape ways, at least two hundred yards wide each. At these points the levee should not be raised to within, say, two feet of that above and below, and an open way of their full width, or more, should be provided immediately behind them, leading back to the lowest part of the bank.

On each side of these open ways a dense growth of young timber, several hundred feet in width, should be continuously cultivated to prevent the lateral escape of strong currents which would tear up cultivated or improved lands, and the base of these outlets behind the levees, as in front, should be cultivated in young timber to prevent deep cutting when the floods make their escape through them.

By this means the total destruction of most valuable property would be avoided. When the levees broke, it would be in places where least damage would be done behind them; and, as in my opinion these levees will be overtopped periodically unless the waters find other escape than by the river, the measure proposed is certainly a wise one, if the results of my investigation are to be relied upon.

THE WORKS OF THE SEASON—1880.

RIVER IMPROVEMENTS.

The foregoing memorandum has formed the basis of action in projecting all river improvement works during the past season. The specifications for these works, given in full as appendices to this part of my report, sufficiently explain the location, object, character and extent of each one, so that it would be superfluous to take up the subject here, particularly after the general practice has been discussed in the paper just reproduced.

THE YUBA AND BEAR RIVER BRUSH DAMS.

General Remarks concerning the Plans.

As stated in the report of the Board of Directors, the dams were not built in strict conformity to the specifications as originally drawn. The reasons for the changes made, so far as I am informed, were fourfold, namely: economy of cost, economy of material, economy of time, and the better disposition of material to effect the objects of the work. I have remarked in a report to the Board of Directors (see page 17 of their printed report) the difficulty of describing a work of this character in specifications so that there will be no departure from them in construction. It is simply impossible to provide for every contingency which may arise in the course of constructing an engineering work, and most of all, it is not be expected that works of this nature can be so planned at first as to avoid the necessity of modification as they progress.

Location of the dams.

On the Yuba River it was proposed to locate the structure at the site known and referred to in former reports as De Guerre Point—the most westerly foothill proper on the north bank of the river, and about 9.28 miles in a straight line above the county bridge at Marysville. By request of the President of the Board of Directors of the Drainage District, the specifications were modified so as to apply also to a site two miles down the river, and about opposite the lowest edge of the high plain or rolling land on the north side thereof. The Board of Directors advertised and received bids for the construction of the work at both sites mentioned, and a contract was let on a bid applicable to that last mentioned, where the dam was finally located. The dam on Bear River was built where originally projected, the only point advertised, namely, at Johnson's Crossing, about —— miles above the railroad bridge.

Dimensions of the dams reduced.

Previous to the letting of these contracts, by request of the members of the Board, the plans and specifications were remodeled, so as to reduce as much as was safe the size or cross sectional dimensions of the structures, with the view of economizing on their cost. These changes were made with the concurrence of the consulting engineers, and the plan as finally contracted upon received the approval of both Mr. Eads and Colonel Mendell. From this general plan there has been no material deviation so far as size or cross sectional dimensions are concerned.

More fine brush introduced.

It was found immediately on commencing the dams proper that the introduction of more fine pliable brush and a less number of poles or small trees than the specifications strictly called for would make in every way a safer and better dam for the purpose intended, and accordingly the Directors, with my advice, ordered the change in this respect to be made, and with this deviation, also, a wire fastening was substituted for the spiking spoken of in the old specifications, and this in itself was an alteration for the better, seeing that the safety of the dam may depend on its pliability when it sinks unevenly.

Earthwork embankments.

As the work on the Yuba dam progressed and was about one half finished, the Winter drawing near, it became apparent to the Directors that the time before the waters should rise would probably not serve in which to complete the structure. They felt satisfied that the contractors were doing all in their power to push the work forward, but owing to the difficulty of securing men and teams they feared that the first floods would put a stop to operations before the gaps in the dam could be closed and all brought up to grade. It was proposed by myself that the central three thousand feet of the work, which was not then commenced, should be brought only to a height of two feet instead of five or six feet, for thereby time would be saved, and the pressure on the whole structure would be much relieved during the first season. The rains holding off unusually long, it was finally determined, however, and ordered by the Directors, that this central portion be built up to the elevation of the rest of the structure, but that an earthwork embankment or levee should be substituted for the dam at each end for about 600 feet in length, which portions had not yet been built, and this was done.

The ballast on the dam.

As before remarked, the original specifications were drawn for a dam to be built on the Yuba River at De Guerre point, where the line across was quite open and free from obstructions, and the ordinary water flow was confined to distinct channels several feet depressed below the general elevation of the sand plain which forms the high water bed of the river. This locality had been quite thoroughly examined, and the character of material at hand for the construction, and of the bottom upon which the structure would rest, were known. Accordingly, it was specified that gravel and coarse sand were to be used in a loose state as a backing. When the advertisements were made for bids for work at the other two sites, which had not been inspected the previous season, the waters were too high to admit of an examination of the lines; and yet the work must be advertised immediately, in order that it could be completed before the Winter set in. Thus, gravel for backing could not be found where the dams were built, and, perforce, sand was used in its stead; and it was seen at once, when the water was put against it, as had been foretold, that it must be put in sacks to answer the purpose. This constituted the fourth deviation from the original plan and specifications drawn, and is the evidence of one of the most important of the many practical lessons learned in their construction.

The experience of the work.

Of course it is easy enough now that these experiences have been had, to see wherein the works could have been improved upon from the beginning, and built at less expense, and future operations will be greatly facilitated by the lessons of the past. This work has been frequently referred to in the discussions of it as an experiment, and, although I have in former reports taken occasion to explain its real status in this respect, it may not be amiss to remark here again that all engineering works are experiments in some certain degree in each instance, for we cannot build two ships, on the same model even, that will sail just alike. The storage of these sands by means of brush dams is an experiment which has been tried on a small scale in numerous instances throughout our mountains, and nature has made the experiment on the Yuba and Bear Rivers on a large scale. The construction of these dams is an experiment, in that we depart from precedent in details to some extent; but the principles involved have been experimented upon numberless times, and are well understood. Thus, in speaking of lessons learned as the results of the workings of these constructions, it is perfectly legitimate to conclude that in some of its details our work has been experimental, but taken as a whole, it is not any more so than nine tenths of the large structures successfully completed by engineers.

General aspect and length of the dams.

The Yuba River dam as completed for the season, consists of a brush and sapling embankment 8,900 feet in length, with a bulkhead of similar materials at each end, which is joined with the hard rolling land on the north, and the levee on the south side of the river, by an embankment of earth curving up stream on nearly a quarter circle, and about 600 feet in length.

And the Bear River dam consists of a similar main structure commencing at the hard high bank on the north side of the river, extending across it for 5,875 feet, and thence to high land on the south an earth levee extends a distance of 1,500 feet.

The material used.

The material of which these dams were constructed may be classed as fine brush, coarse brush, and small trees. Straight, flexible, young willow switches, and saplings less than an inch in diameter of butt and from five to twelve feet in length, may be considered as fine brush for the purposes of this description; all over this, and less than three inches in diameter of butt and twenty feet in length, as coarse brush; while the small trees ranged from three to eight inches diameter of butt, and twenty to fifty feet in length.

The composition of the dams.

The dams consist of (1) a flexible willow mattress as a formation and lower apron; (2) an upper apron of small trees; and (3) the dam proper composed of alternate layers of coarse and fine brush and trees; the whole finished off with a single or double layer of trees, weighted with bags of sand in a layer, and loose sand on the up stream face.

They vary in height from three to fifteen feet, and in width, on the foundation, from sixty to one hundred and twenty feet.

The mattress.

The mattress is one foot thick, made of fine brush in three layers, and sewed together with number fourteen maleable iron wire, in rows of sticks four feet apart. The pieces of sticks composing the bottom and top layer run across the mattress, or up and down stream; the pieces of the intermediate layer run lengthways of the mattress or across the stream; and the stitching, of course, runs parallel with the pieces in this layer, or across those in the bottom and top layers. These mattresses were made in continuous sections, several thousand feet in length and thirty-five to fifty-five feet in width, according to the height of the dam, and laid in an excavation one to two feet in depth along the line of the dam.

The upper apron.

Upon the up stream edge of the mattress—the upper apron, composed of one, two, or three layers (according to the height of the dam), of small trees, partially rests. These trees are placed close together, butts down stream, lapping over on to the mattress from fifteen to twenty-five feet, and tops up stream, resting in a pit from three to five feet in depth at the upper toe of the dam; fine brush being placed under them for ten to fifteen feet above the upper edge of the sewed mattress.

The dam proper.

Upon the tops of the trees, whose trunks and butts compose the upper apron, the dam proper rests, built in wedge-shaped layers, from one and a half to three feet in thickness, of coarse and fine brush, generally laid butts down stream, stiffened and drawn down with small trees, which extend from the lower face back into the heeling pit, and finally covered in with similar trees, in single or double layer, extending from the crest back into the heeling pit.

As completed, the upper slope, composed of the layers of trees, before receiving the backing of sand, and bags of sand, rested upon a slope of from one on four to one on five. The down stream slope, composed of the butt ends of the brush and trees, was on a slope of about one on one—45 degrees.

Under the full length of the dam four rows of tree polls were heavily staked down in trenches, and thence heavy wires extend up through the structure at every eight feet of distance. Thus the upper apron is firmly wired to the mattress, and the dam in turn to it. The brush tops of the trees composing the lower apron, of those interspersed through the body of the dam, and of those forming the top sheathing of the structure, are all buried together in a pit four to five feet in depth at the foot of the upper slope, and weighted with the sand taken out of the pit.

Expected operation of the dams.

It is intended that these dams shall admit the passage of the water through them freely until the lodgment of the sands behind them causes a silting up of the whole structure, and it is expected that they will settle unevenly the first year because they have been built over wide flats of recent deposits of very variable quality and uneven depth, and because they themselves, according to the undulations of the ground on which they rest, vary in height. This settlement may be considerable at points where the old deep channels once existed, and sufficient in extent to detract from the efficiency of the structures in holding back the sands during the first year; but the second year they can be brought to grade, and will probably remain there without further material settlement. It is not expected that the dams will, in any great degree, hold back the fine sediment carried in suspension during the flood season, for the volume of water will be too great to be retained long enough to cause a precipitation of this light material. But during the periods of ordinary flow in the streams, and the low water period, the slums, as well as the sands, will in great measure be deposited above the dams.

Retention of the sands.

It is expected that the sands will be ultimately retained above these dams approximately on the same slopes as are found to exist in the high water bed of the stream at present, although, before this slope is reëstablished, of course, some portion of the sands would be washed over the dam each year, and, as the filling becomes nearly complete, the loss will amount to a considerable proportion of that brought down. It is expected, however, that the crest of the dams will be raised by the addition of more brush whenever necessary, and thus the more perfect effect be maintained.

The conclusion that the sands will lodge behind these dams approximately, or the slopes they have now assumed in the river bed, is somewhat fully explained in Part III of my report of January, 1880, at pages 38 and 39; suffice it to say here, that nature has built brush dams by the growth of willows on the sand-covered flats of the Yuba and Bear Rivers; the detritus rests above these imperfect structures or grades, varying from four to twenty-five feet per mile, and continually heaps up higher on plains of sands having such grades, and which form the high water river channels. Exactly the same conditions are to be maintained on these flats as now exist, and nature's work of dam-building is only to be concentrated and made more efficient. Surely we can expect a like result, and the idea that a brush dam will only hold material behind it to the elevation of a plane level with its crest, under the conditions we have, will give way to that maintained in the reports upon which this work is based.

Final estimates on the dams, season of 1880.

The following figures are taken from the final estimates made by Mr. C. D. Rhodes, Resident Engineer:

Amount of work and material in the Yuba River Dam.

Class of Work.	Cubic Yards.
Earthwork.	
Excavation for foundation	38,431.5
Ballast on and in dam	40,907.0
Embankment (ends of dam)	28,994.4
Total	108,332.9
Brush and Tree Work.	
Brush in sub-foundation	8,412.4
Brush and trees in dam and apron	62,552.1
Brush and trees in bulkheads	381.8
Brush in mattress or lower apron	16,921.8
Total	88,267.5

Amount of work and material in the Bear River Dam.

Class of Work.	Cubic Yards.
Earthwork.	
Excavation for foundation	33,302.20
Ballast on and in dam	36,483.65
Embankment (ends of dam)	21,883.48
Total	91,669.33
Brush and Tree Work.	
Brush in sub-foundation	5,266.37
Brush and trees in dam and apron	36,174.40
Brush in mattress or lower apron	10,905.31
Total	52,346.08

THE YUBA RIVER RESERVOIR.

Dimensions.

The Yuba River detritus reservoir, from the dam to Big Ravine at Timbuctoo—the point where the cañon becomes narrow and of heavier gradient—is 8.07 miles in length, and varies in width from 560 feet to 9,550 feet. The average width is 4,390 feet, and the area 4,040 acres. For the first mile above the dam the fall is 10 feet; gradually increasing, it is 16 feet for the middle mile, 24 feet for the upper mile of the reservoir site; and the average is 14.77 feet per mile.

The whole site is bounded by natural highlands, except for 1.7 miles above the dam, on the south shore, where a levee averaging 6 feet in height has been built. Raising the surface of the sands in this reservoir 6 feet would make them cover 4,292 acres, or 252 acres which they do not now cover; and raising them 12 feet, or 6 feet additional, would make them cover 4,560 acres, or 520 more than they do now. This land, which would be covered in, is for the most part very poor, unproductive, and uncultivated soil, although several small improved tracts of farming land and orchard property are included.

Storage capacity.

The first 6-foot layer in this reservoir is 40,200,000 cubic yards, and the second 6-foot layer is 42,500,000 yards in content.

According to the estimates of 1879, based on the investigations made during the season, as embodied in my report of January, 1880, there are 22,326,500 cubic yards of material washed annually into the cañons of the Yuba and its tributaries by the hydraulic mines. About 10 per cent. of this, or 2,232,650 cubic yards are believed to rest in the cañons above, by reason of the material being exceedingly large and heavy rocks; about 30 per cent., or 6,697,950 cubic yards, are believed to be of such fine material that it will be carried out in suspension and not be stopped by the action of the dam; thus leaving 60 per cent. of the whole, or 13,395,900 cubic yards annually of a character (sand and gravel) which will be deposited in the reservoir.

From the above it will be seen that each 6-foot layer in this reservoir is in content equivalent to all the material which can be arrested in the river in about three years. As explained elsewhere in this report, however, it is not to be expected that the dam will arrest all of this material in three years, but it will possibly have to be raised some after the first year, and certainly after the second, to prevent much sand from going by while it is gradually raising above.

The Bear River reservoir.

Dimensions.—The Bear River detritus reservoir, below the opening of the foothills where the sands commence to spread over a wide space, is 1.7 miles in length, has widths varying from 400 to 8,240 feet, with an average of 4,945 feet, and is 920 acres in area.

The fall in grade of the sands, as they now rest from the cañon to the dam, is at the rate of 10.2 feet per mile.

Raising the surface of the sands 6 feet would make them cover an area of 1,032 feet, or 112 acres more than they do now; and raising them 6 feet additional, or 12 feet in all, would make them cover 1,120 acres, or 200 acres more than they do now.

These lands are of a poor quality, and almost entirely uncultivated, being, for the most part, red gravelly hill slopes by which the site is bounded on all sides above the dam.

Storage capacity.

The first 6-foot layer in this reservoir is 8,950,000 cubic yards, and the second 6-foot layer is 10,820,000 cubic yards in content.

According to the estimates reported, as before referred to, there are 5,550,000 cubic yards of material put into Bear River and its tributaries annually by the hydraulic mining operations. Of this amount, as before, 10 per cent., or 555,000 cubic yards, remains above in the cañons and on the dumps; 30 per cent., or 1,665,000 cubic yards, would go out in suspension, because too fine to be arrested by the dams; and 60 per cent., or 3,330,000 cubic yards, are of a character (sand and gravel) such as the dams, if maintained, will cause to rest in the reservoir above it.

From this it will be seen that the reservoir will hold in its first 6-foot layer all the material which can be arrested of that which will come down in two and three quarter years; and in the second 6-foot layer, all that will come down, etc., in somewhat over three years. But here again we must remember that some sands will probably escape after the first year, before the reservoir is near full, and the dam must be built higher certainly the second year.

Very respectfully, your obedient servant,

WM. HAM. HALL,
State Engineer.

APPENDIX.

SPECIFICATIONS FOR RIVER WORKS—SEASON OF 1880.

In addition to the specifications for the brush dams, which were embodied in the report of the Board of Directors of Drainage District No. 1, and alluded to in the report to which this is an Appendix, the following specifications were prepared and submitted to the Board during the season. It has been impracticable to include in this report the plans to which these descriptions apply. Copies may be seen at this office, or at the office of the Board of Directors.

The specifications for the dams are numbered Sets 1 and 2, hence the present papers are numbered from Set 3 forward.

SET No. 3.

Specifications for the Construction, Repairing, and Protection of Levees necessary to prevent the spread of Detritus from the Channel of Yuba River, season of 1880.

LOCATION AND GENERAL CHARACTER OF WORK.

Besides the dams and other brushwork for impounding the detritus for which specifications have already been drawn, the principal works which it is necessary at present to undertake in the line of operations calculated to prevent the spread of detritus from the Yuba River, may be divided into four separate parcels, as follows:

A—ON THE NORTH SIDE OF THE RIVER.

1st. Protecting the levee known as the Brown's Valley grade and its extension, at certain points, from its upper end down to the Citizens' Levee.

2d. Repairing, adding to, and protecting the embankment known as the Citizens' Levee, from the Brown's Valley grade to the big break just below the Indian mound.

B—ON THE SOUTH SIDE OF THE RIVER.

1st. Repairing, adding to, and protecting the levee as may be necessary, from the railroad crossing, to its upper end, and extending the same to a point near the proposed site number one, for a dam, known as the De Guerre dam site.

2d. Repairing, adding to, constructing, and protecting the levee and reconstructing and protecting the river bank at points from the railroad crossing down the south and east banks of the Yuba, and along the same bank as extended down the Feather River to a point —— below the —— orchards.

For each of these works separate specifications are prepared, as follows:

A—1ST. FOR REINFORCING AND PROTECTING THE BROWN'S VALLEY GRADE LEVEE AND ITS EXTENSION AT CERTAIN POINTS.

Reinforcing the Levee.

Where necessary, in the judgment of the engineer in charge, the embankment is first to be reinforced and brought to its original or a flatter slope, with earth scraped from the borrow ditch on the river side, leaving a berm equal in width to that at the foot of the levee as originally constructed. Such reshaping or reinforcing of the bank is to be conducted on the river side only, and is to be done before the brush work of protection is commenced.

The face and foot of the levee is to be cleared of all obstructions and rubbish where it is to be thus reinforced, the earth thereof is to be loosened by ploughing, or otherwise to insure a union of the new soil with that in place, and the work of moving material is to be done with scrapers.

There may be from 10,000 to 15,000 cubic yards of this earth work to be done, principally disposed at one locality on the extension of the embankment through the Teegarden property.

Protection of Levees.

There are two classes of brushwork to be done on this line of operations.

The first is calculated to prevent the washing of the earth of which the levee is built, by the wave action at time of high water.

The second is expected to control and modify the currents which pass the face of the levee, and to cause a deposit of sand and other sediment against its base.

A revetment of brush laid on the water slope of the levee constitutes the first class of work. The second class may be designated as brush spur work—consisting principally of open brush wing dams placed nearly at right angles to the levee line, to check and break up the lines of the current along its base and front.

PROTECTION OF LEVEES—BRUSH REVETMENT.

A mattress of small willow brushwood, placed upon the water slope of the levee, from near its base to within three feet in elevation of its crown height, and pegged down to the embankment, constitutes the protection here called a brush revetment, and it may be complete for the full width of the face, or partial only, as circumstances warrant or call for its application.

The poles of the brush must not exceed three inches in largest diameter, and should not average over one and one half inches in thickness.

A layer of small brush, an inch or less in diameter, is first to be laid on, with the pieces placed longitudinally—with the length of the levee, in a horizontal position—to a depth of three inches when pressed down; upon this a layer of the larger saplings is to be placed lengthways, up and down the levee face, to a similar depth.

On this mattress, rows of sapling poles of the larger size, placed three feet apart, after being pressed firmly down, are to be pegged through to the soil below by crossed pegs of similar material, two and one half to three feet in length, driven at six to eight feet intervals on each row.

The width of the brush revetment will vary from ten to twenty feet, and there may be about 10,000 square yards of it in all to be laid on the face of the levee, where protection is most needed, and at the localities designated by the resident engineer.

PROTECTION OF LEVEES—BRUSH SPUR WORK.

At right angles to the line of embankment, or on such other alignment as the engineer in charge may lay down, and spaced at intervals, varying from 100 to 1,000 feet in length—from spur to spur—light wing dams or spurs from 350 feet in length, built of brush, as hereafter specified, are to be coustructed for the full length of this levee on the river side.

The drawings hereto attached illustrate the general style of these constructions, which may be described as that of inclined open work walls of brush, supported on a string piece or ridge pole, resting in the crotch of small rough timber cross horses, placed at convenient intervals.

Cross Section A shows the style of construction adapted for such a brush spur for heights under six feet.

Cross Section B shows a style of bracing the work well adapted to larger spurs.

The horses and bracing shown by these figures—diagrams 1 and 2—are to be placed at 12-foot intervals in the line of the spurs, and string pieces or ridge-poles are to be laid from one to the other and to the levee, as shown in elevation by diagram 3.

The pieces constituting the horses and bracing are to be spiked together with one cut iron spike, reaching all the way through the two at each crossing.

If made of round, rough timber, they should be roughly flattened at each crossing with an ax or hatchet to make a closer fit, and facilitate nailing.

The pieces A, in the plane of the face of the brush wall, next to and on each side of the cross-horse heads, are to be spiked to them and the ridge pole, with one similarly long spike at each bearing; as also pieces B to be laid one on each side of the frame and stake pieces of each frame or "bent," as the whole taken together may be called.

Between the bents thus placed and constructed, the open brush wall is to be built, sloping in the plane of the pieces A, and made of brush saplings or small trees, varying in length from 15 to 35 feet, according to the size of the spur, placed at intervals about three times the average thickness of their trunks, and alternately with their butts up and down, resting upon and sloping up stream from the ridge pole.

Their lower ends, constituting the up stream toe of the spur, are to be buried for five to ten feet of their length, according to the size of the work, in a trench a foot and a half deep, as shown in the sections.

The outer end of each spur is to be furnished with four to six extra pieces in the plane of the pieces A, and buried to a depth of 2 feet at their lower ends.

All the materials in these structures, except the ridge poles, stakes, and cross horse pieces, must be used without trimming or dragging the small branches off of it.

The ridge poles, stakes, etc., may be of sawed lumber, squared to the smaller dimensions given for round timber on the diagrams.

If the pieces used in the face of the brush wall be not well covered with small branches, then smaller brush is to be interwoven, so as to produce a decidedly brushy appearance.

There will be about 6,000 linear feet of this spur work, averaging six (6) feet in height, equivalent to 4,000 square yards, measured as hereafter provided.

MISCELLANEOUS PROVISIONS.

There is no water running during this, the dry season, where it is proposed to build these spurs, but should the river turn, or the waters rise so as to put water in this channel at any time before the completion of the work, the contractor shall turn it out again so as to finish his job according to agreement.

The brush and trees necessary for the construction of this work, are to be cut off the sand-covered flats adjacent to its site, and the Directors guarantee to the contractor the right to cut and remove the same without compensation for damage, or payment for the material; *provided,* that in such cutting and transportation, the contractor constructs all necessary roads or causeways, and openings in fences, etc., and exercises due diligence and care to avoid unnecessary damage; *and further provided,* that the Directors will not be responsible for any damage occasioned by reason of the escape of stock, or the inroads of stock upon crops or pastures, which may be occasioned by the openings in fences made by the contractor, or in any way by the occupation of premises by him.

The brush cutting shall be conducted under the direction of the engineer in charge, and at such points and off from such ground as he may direct; *provided,* that none at points materially nearer to the location of using can be had; *and provided further,* that in no case shall brush be cut where by reason of so doing, an existing levee, or one to be built or repaired by the Board of Directors, shall be exposed to the wave-action, or wash by the currents at flood periods.

The Directors guarantee to the contractor the right of way for the transportation of all material on such routes as may be reasonably practicable, and on conditions, as respects liability for damages, similar to those already inserted in the section concerning brush cutting.

All brush cut in the prosecution of this work, and remaining unused at its completion, or forfeiture of contract, is to revert to the Board of Directors, and the contractor is not to lay claim after the work is done to any peculiar privileges of right of way, or right to material of any kind other than his plant of tools and appliances, which may be removed from the premises.

LAYING OUT AND MEASUREMENT OF WORK.

This work is to be staked out by the resident engineer, under direction of the State Engineer, and is to be carried forward to the satisfaction of the engineers and the Board of Directors of the district.

All extra work of any class herein specified, which the contractor may undertake, performed on the same side of Yuba River, shall be done at contract prices on the measurement thereof.

All earthwork shall be completed to depths of one tenth over true grade line, to allow for settlement, and measured only to grade.

Measurements of earthwork added to levees to be made in the pit from which excavated, or on the bank upon which placed, as may be most convenient to the engineer in charge, or as the resident engineer may direct.

Measurement of brush revetment to be made in place, according to average width and total length.

Measurement of brush spurs to be made according to average vertical height from the natural ground surface, as found to the lower edge of the ridge pole in each rest, and in the total length constructed.

Work is only to be accepted and approved, and taken off the hands of the contractor, upon the final completion, in all respects, of all to be done along the frontage of the Brown's Valley grade embankment and its upper extension.

In case of any undue settling of any part of the work, after the completion of that part, the integrity of the work is to be preserved in such manner as the State Engineer may specify and the Board of Directors direct, and consequent differences between the contractor and the Board of Directors are to be made by the Directors in their discretion.

BIDS FOR THE WORK.

The work to be executed under these specifications is classified as follows:

(1.) Earthwork for reinforcing or re-forming levee.
(2.) Brush revetment.
(3.) Brush spur work.

Earthwork includes all that may be necessary to do in excavating, moving, and placing the material at the proper slope and depth on the levee face.

Brush revetment includes all that may be necessary in cutting, transporting, laying, and pinning down the brush.

Brush spur work includes all that may be necessary in cutting, transporting, and constructing the light spurs described.

Bids are desired for this work as follows:

For earthwork: Per cubic yard, measured as aforesaid.

For brush revetment: Per square yard on the face of the embankment.

For brush spur work: Per square yard in the vertical plane under the ridge pole and above the ground line.

A 2.—Repairing, adding to, and Protecting the Citizens' Levee.

It is proposed to strengthen this levee, and to raise it to an elevation of three and one half feet above the high water plane of April, 1880, from its commencement at the Brown's Valley grade to a point near the deep crevasse below the Indian mound, and to protect it at points with brushwork similar to that specified for the protection of the Brown's Valley grade.

The total length of the proposed work is about 6,200 feet. The present levee varies in height above the natural ground line from two feet to nine feet, and is very irregular in grade and cross-sectional form as well as in height.

The following table and accompanying sectional diagrams show, approximately, the extent and disposition of the work:

TABLE SHOWING DIMENSIONS AND AMOUNT OF EARTHWORK ON THE CITIZENS' LEVEE WORK.

Length.	Old Levee—Average height, feet	New Levee—Average height, feet	Additional height, feet	Total height, feet	Present slopes	Amount of earthwork, cubic yds.
1,300 feet	8	------	3	11	1 on 1½	7,000
700 feet	6	------	4	10	1 on 2	4,700
2,400 feet	4	------	4	8	1 on 2½	13,000
1,600 feet	------	6	------	------	1 on 2½	2,300
200 feet	3	------	3	6	1 on 2	900
Total	------	------	------	------	------------	27,900

All of the material to accomplish this work must be taken from the river side of the embankment.

For the first 2,000 feet of levee a borrow ditch, on the river side, scoured out by the current to a width of 30 to 50 feet and a depth of 3 to 4 feet is situated, close to the base of the embankment. At some points there is no berm at all.

Material for this part of the work is to be taken from the open flats on the opposite or north side of the ditch, and brought across the same on causeways, to be filled in for that purpose.

For the next 2,400 feet, material must be taken from a borrow ditch on the river side of the levee, leaving a berm at least fifty feet in width, covered with a young growth of trees already over most of the ground.

For the new levee, material shall be taken from the water side from a borrow ditch outside of a 30-foot berm, and the material in the old levee itself may be used for the purpose.

For the last 200 feet of work, the present levee shall be raised with material taken from without a 50-foot berm, as in the case of the second 2,400 feet.

Wherever additions are made to existing levees, the face of earth to which material is to be added shall be well loosened by plowing or otherwise. The space covered by the new levee shall be well plowed before the levee construction is commenced, and if deemed necessary by the Engineer in charge, shall be trenched by a second or third plowing and scraping over lengthways to a depth of 1½ feet and width of 6 feet, which trenching shall be done at the same cost per cubic yard as the earthwork in the embankment.

All rubbish, stumps, roots, etc., shall be cleared away from the site of new work, and the material used shall be free from such foreign matter.

PROTECTION OF THE LEVEE.

The first 2,000 feet of this levee, and at other limited points below, is to be protected by brush revetment or spur work as may be deemed advisable, in the same manner as specified for the protection of the Brown's Valley grade.

There will be from 2,100 to 2,700 linear feet of spur work, averaging 7½ feet high, making in all from 1,750 to 2,250 square yards of the work, measured in the vertical planes of the spurs.

There may be in all 1,500 to 2,000 square yards of revetment with brush, the same as heretofore described for the Brown's Valley grade.

MISCELLANEOUS PROVISIONS.

Laying out and Measurement of Work—Bids for Work.

All under the above headings incorporated in specifications (A 1) for the Brown Valley grade work, shall be applicable to the work here described, and any explanation of terms therein given shall be applicable here also.

B 1.—Repairing, adding to, and Protecting the Levee on the South Side of Yuba River.

Above the line of crossing of the California and Oregon Railroad, there is a levee for nine miles.

The first 6,500 feet of this embankment—to the Yuba Hotel—is not to be enlarged.

Above the point at the Yuba Hotel, to the head of the levee, is a distance of 36,000 feet.

At 31,500, on this line, the southern end of the dam to be built is located.

Up to this point the levee has an average height of 4.7 feet, with extremes of 3 and 6 feet above the average ground elevation, on the two sides of it, and slopes varying from 1 on 2 to 1 on 4.

It is proposed to raise this levee to an average height of 6.3 feet; crown width of 6 feet, and slopes of 1 on 3 on the river side and 1 on 2 on the land side.

The material is to be obtained from the river side of the work, and is to be deposited on or against the old work, generally on the same side, as in the judgment of the engineer in charge may seem proper, and the total amount to be moved will be about 68,000 cubic yards.

Above the line of the proposed dam a levee, averaging 7.2 feet in height, with a maximum height of 9 feet, a crown width of 8 feet, slopes of 1 on 4 on the water side and 1 on 2½ on the land side, is to be built along or near the bank of the river to high land, a distance of 7,400 feet, more or less.

This embankment is to be put up in the most thorough and careful manner.

The ground is to be thoroughly cleared of stumps, roots, and undergrowth, plowed over the whole surface of the work, and trenched to a depth of 2 feet and width of 8 feet under the crown of the levee.

All material is to be taken from the river side of the embankment, and a berm of 30 feet is to be left between the foot of the slope and the borrow ditch.

Total amount of material to be moved in this work will be about 62,000 cubic yards, or in all, under these specifications (B 1) about 130,000 cubic yards, more or less, to be measured as hereafter provided.

PROTECTION OF LEVEES.

The water face of the embankment below the line of the proposed dam is to be protected with brush revetment and with brush spurs, at various points on its course, as specified heretofore for the protection of the Brown's Valley grade.

The total amount of revetment on this work will be about 5,000 square yards, and the total amount of wing dams about 2,400 linear feet, averaging six feet in height.

Above the line of the proposed dam, the water face of the levee is to be protected by brush revetment, and about 6,000 square yards of this work is to be done thereon.

MISCELLANEOUS PROVISIONS.

Laying Out and Measurement of Work—Bids for Work.

All under the above headings incorporated in specifications (A 1) for the Brown Valley grade work, shall be applicable to the work here described, and any explanation of terms therein given shall be applicable here also.

B 2.—Levee and Bank Work below the Railroad Crossing—South Bank of Yuba, etc.

An embankment or levee is to be thrown up 34,400 feet in length, on or near to a line already staked out, and in so doing all cuts in the river bank are to be closed.

The following table shows the dimensions and amount of work to be done:

LOWER LEVEE SOUTH BANK OF YUBA AND FEATHER RIVERS.

Crown width, 6 feet. Slopes, river side, 1 on 3; land side, 1 on 2.

From Station to Station.	Maximum Height.	Minimum Height.	Mean Height of Levee.	Cubic Yards.
0 ----------- 1,200 feet ----------- 20	5.7	3.4	4.8	3,840
20 ----------- 2,000 feet ----------- 40	9.3	2.4	4.7	6,170
40 ----------- 2,000 feet ----------- 60	9.9	2.2	6.9	11,884
60 ----------- 2,000 feet ----------- 80	9.0	3.8	5.2	7,318
80 ----------- 2,000 feet ----------- 100	6.1	4.4	5.3	7,552
100 ----------- 2,000 feet ----------- 120	5.9	3.4	5.0	6,852
120 ----------- 2,000 feet ----------- 140	9.5	1.5	4.2	5,132
140 ----------- 2,000 feet ----------- 160	7.6	2.1	4.4	5,540
160 ----------- 2,000 feet ----------- 180	7.4	1.2	4.0	4,740
180 ----------- 2,000 feet ----------- 200	9.3	.0	4.0	4,740
200 ----------- 2,000 feet ----------- 220	15.7	4.4	5.7	8,550
220 ----------- 2,000 feet ----------- 240	10.9	4.0	5.3	7,558
240 ----------- 2,000 feet ----------- 260	8.7	4.0	4.6	5,962
260 ----------- 2,000 feet ----------- 280	9.2	3.8	5.2	7,318
280 ----------- 2,000 feet ----------- 300	12.1	4.0	6.0	9,332
300 ----------- 2,000 feet ----------- 320	7.1	3.9	4.4	5,540
320 ----------- 2,000 feet ----------- 340	14.6	2.9	4.3	5,336
340 ----------- 1,200 feet ----------- 352	5.2	3.0	3.7	2,508
				115,878

All material is to be taken from the river side.

A berm of twenty feet is to be left between the foot of the levee slope and the edge of the borrow pit. Borrow pits are not to exceed 1,000 feet in length, the ground being left solid between each two for twenty feet in length.

The ground's surface is to be thoroughly cleaned of roots—stumps grubbed from it, and it is to be well plowed, over the entire bed of the embankment.

In the discretion of the engineer in charge, the ground may be trenched six feet in width and one and a half feet in depth, under the crest of the levee where necessary, at the same rate per cubic yard as the other earthwork is carried on.

The work is to be done with scrapers, and the usual allowance of one tenth made for settlement.

PROTECTION OF LEVEE.

This levee is to be protected, at points where the engineer in charge may deem it necessary, in the manner prescribed for the other levees, specifications for which are embraced in this set.

Of brush revetment there may be 6,000 square yards.

Of brush spurs there may be 2,000 square yards.

MISCELLANEOUS PROVISIONS.

Laying Out and Measurement of Work—Bids for Work.

All under the above headings incorporated in specifications (A 1) for Brown's Valley grade work shall be applicable to the work here described, and any explanation of terms therein given shall be applicable here also.

Summary of Work to be Done on Yuba River, Under Foregoing Specifications.

Locality.	Earthwork—Cub. yards.	Brush Revetment—Sq. yds.	Brush Spurs—Sq. yards.
North Bank.			
Brown's Valley grade ----------------------------------	12,000	10,000	4,000
Citizens' levee --	27,900	1,500	1,750
South Bank.			
Upper levee ---	130,000	5,000	1,600
Lower levee ---	116,000	6,000	1,000
Totals --	285,900	22,500	8,350

SET No. 4.

Specifications for the Construction, Repairing, and Protection of Levees Necessary to Prevent the Spread of Detritus from the Channel of Bear River, season of 1880.

LOCATION AND GENERAL CHARACTER OF WORK.

Besides the dam and other brushwork for impounding the detritus for which specifications have already been drawn, the principal works which it is absolutely necessary at present to undertake, in the line of operations calculated to prevent the further spread of detritus from the Bear River, may be divided into five separate parcels, as follows:

A—ON THE NORTH SIDE OF THE RIVER.

1st. Raising, strengthening, extending, and protecting the upper outside levee, from Johnson's Crossing to a point near Oakley's.

2d. Raising, extending, and protecting the lower Webster levee.

B—ON THE SOUTH SIDE OF THE RIVER.

1st. Constructing a levee from high land, in Section 1, T. 13 N., R. 5 E., to the Boulware mound, at the corner of Sections 8, 9, 15, and 17.

2d. Repairing, raising, and extending the lower or Perry and Johnson levee.

C—IN THE BED OF BEAR RIVER.

Clearing a channel way through the brush thickets at certain points.

SPECIFICATIONS—NORTH SIDE WORK.

A—The Upper Outside Levee.

From Johnson's crossing down this levee is about 36,500 feet in length, and averages about 4½ to 5 feet in height above the elevation of the sand flats on the river side.

Towards its upper end this levee is to be raised four feet, and at the long bridge, near its lower end, it is to be raised about three feet.

On the line of this work, above the railroad bridge, there will be about 70,000 cubic yards of material to move; between the railroad bridge and the long bridge, about 40,000 cubic yards; below the long bridge, including the raising of the old and construction of some new five-foot levee, there will be about 34,000 cubic yards to be moved.

All of the foregoing levee, when finished, is to be five to six feet wide on top.

Where new work is done and old work is strengthened at exposed points, it is to have a slope of 1 on 3 to 1 on 4 on the river side, and where protected by growing brush, it is to have a slope of 1 on 2 to 1 on 3 on the river side.

All, relative to the preparation of the ground for work, which has been said in the specifications for the levee work on the Yuba River, is intended to apply on this work.

Material is to be taken from the riverside of the embankment outside of the fringe of trees which now protects the levee, at least fifty feet from the foot of the slope, and at such points as the engineer in charge may designate, and the work is to be done with scrapers.

PROTECTION OF THE LEVEE.

This levee is to be protected at such points as, in the judgment of the engineer in charge, it may be necessary, with a revetment of brush, or with light brush spurs as described in the specifications for the Yuba River work. All definitions, restrictions, and directions applying under this heading, embraced in the description of the Yuba River work, are to govern herein also.

The following represents an approximate estimate of this character of work to be done on this line:

BRUSH REVETMENT.

Johnson's crossing to the railroad bridge—square yards	2,500
Railroad bridge to long bridge—square yards	1,200
Long bridge to lower end of levee—square yards	800
Total	4,500

BRUSH SPURS.

Johnson's crossing to railroad bridge—square yards	1,500
Railroad bridge to the long bridge—square yards	800
Long bridge to lower end of levee—square yards	200
Total	2,500

MISCELLANEOUS PROVISIONS.

Laying Out and Measurement of Work—Bids for Work.

All under the above headings, incorporated in the specifications for the Yuba River work, shall be applicable to the work here described, and all definitions, restrictions, and directions therein given shall be applicable herein also.

A 2.—The Lower or Webster Levee.

Specifications for this work will be found in a supplement to this set of specifications.

SPECIFICATIONS—SOUTH SIDE WORK.

B 1.—Levee through Sections 1, 2, 10, *and* 9, *T.* 13 *N., R.* 5 *E., from High Land to the Boulware Mound.*

The line of this work is to follow generally the edge of the new heavy deposits on the south side of Bear River, at the locality mentioned.

The levee will be about 23,000 feet in length, of which about half is situated above the railroad crossing and half below.

The levee will be from 3 to 6.5 feet in height, averaging about 5 feet. Outside or river slope, 1 on 4; inside slope, 1 on 2; crest, 6 feet wide; berm, 40 feet in width.

All material to be taken from the river side, and work to be done with scrapers. Ground to be cleared and plowed under full width of levee base. Borrow pits not over 1,000 feet in length, with solid ridge 20 feet in width between each two.

In the discretion of the engineer in charge, the ground under the base of the levee to a width of six and a depth of one and a half feet, is to be trenched where necessary, as described in the specifications for work on the Yuba River.

All, relative to the preparation of ground for work, which has been said in the specifications for the levee work on the Yuba River, is intended to apply in this work.

There will be about 92,000 cubic yards of earthwork to execute on this line of embankment.

PROTECTION OF LEVEE.

This levee is to be protected at such points as, in the judgment of the engineer in charge, it may be necessary, by brush revetment and spur work, as described in the specifications for Yuba River work.

All definitions, restrictions, and directions applying under this heading, and embraced in the description of the Yuba River work, are to govorn herein also.

The following represents an approximate estimate of this character of work to be done on this line:

Brush revetment	4,500 square yards.
Brush spur work	2,500 square yards.

MISCELLANEOUS PROVISIONS.

Laying Out and Measurement of Work—Bids for Work.

All, under the above headings incorporated in the specifications for the Yuba River work, shall be applicable to the work here described, and all definitions, restrictions, and directions therein given shall be applicable herein also.

B. 2.—The Berry or Lower South Side Levee.

This levee is an average of about five feet high above the ground line on the river side.

It is to be raised an average of two and a half feet, and strengthened proportionally for about 10,000 feet in length; the present open breaks are to be closed to full height of the work; and about 4,000 feet of new levee, six feet in height, is to be constructed.

All work is to be finished to dimensions as follows: Crest width, six feet; river side slopes, 1 on 3; inside slopes, new work, 1 on 2, old work same as those existing; berm, 20 feet wide.

All material is to be taken from the river side, the work is to be done with scrapers, and disposed as the engineer in charge may direct.

What has been said heretofore in this set of specifications, with reference to the preparation of the ground for the bed of the levee, shall be taken as applying in this instance also.

There will be in all about 67,000 cubic yards of material to be moved on this work, as follows:

Raising and strengthening old levee	40,000 cubic yards.
Repairing and closing breaks	10,000 cubic yards.
New levee work	17,000 cubic yards.
Total	67,000 cubic yards.

PROTECTION OF LEVEE.

This levee is to be protected, at such points as may be necessary in the judgment of the engineer in charge, by brush revetment and spur work, as heretofore described in this set of specifications.

All that has been said concerning this class of work, in the specifications for work on Yuba River, is to apply here.

There may be, on this line of operations, brush work to the following amounts undertaken:

Brush revetment	2,000 square yards
Brush spur work	1,500 square yards

MISCELLANEOUS PROVISIONS.

Laying Out and Measurement of Work—Bids for Work.

All under the above headings, incorporated in the specifications for the Yuba River work, shall be applicable to the work here described, and all definitions, restrictions, and directions therein given shall be applicable herein also.

C.—In the Bed of the River.

Clearing a channel way through the brush thickets at certain points.

At various localities on the flats, which constitute the high water channel of Bear River, but principally through Sections 14, 15, and 16 of T. 13 N., R. 4 E., it is desired to clear away the thick growth of brush and young timber which obstructs the outflow of the floods, or which turns the flood waters against the levees, so as to leave waterways, varying in width from 100 to 800 feet through the thickets.

The timber and brush is to be cut off close to the ground and removed from the clearings by hauling away or burning.

All material of this character, which may be required for the protection of levees, is to be furnished those who may take it away from such clearings without charge.

There may be in all from 125 to 150 acres of this brush clearing to do; all to be performed to the satisfaction of the engineer and the Board of Directors of the district; and bids are requested for the execution of the work at a fixed price per acre, to be measured by the engineer in charge.

SUMMARY OF WORK TO BE DONE ON BEAR RIVER.

LOCALITY.	Earth Work, Cubic Yards.	Brush Revetment, Square Yards.	Brush Spurs, Square Yards.	Brush Clearing Acres.
NORTH SIDE.				
Upper outside levee	70,000 40,000 34,000	2,500 1,200 800	1,500 800 200	-------- -------- --------
Lower or western	--------	--------	--------	--------
SOUTH SIDE.				
Upper levee	92,000	4,500	2,500	--------
Lower or Berry levee	67,000	2,000	1,500	--------
In the river, between levees, brush and timber clearing	--------	--------	--------	150
Totals	303,000	11,000	6,500	150

REMARKS APPLICABLE TO THE YUBA AND BEAR RIVER SPECIFICATIONS.

The Directors reserve the right to materially diminish or increase the amount of brushwork to be done under these specifications, in each instance, as may be found necessary in the progress of the work.

The total amount of earthwork, in each case, will not vary more than twenty per cent., in any case, from the amount estimated upon. All earthwork is to be completed with the allowance for settlement of one tenth in elevation above true grade lines, and estimates are only to be made to the true grade heights.

Bids are requested for the foregoing work, according to the separate jobs indicated, and at fixed rates per cubic yard, or per square yard for each job.

LIST OF JOBS—YUBA RIVER.

1. *Brown's Valley Grade.*—Strengthening and protecting.
2. *Citizens' Levee.*—Strengthening, raising, extending, and protecting.
3. *Upper South Side Levee.*—Strengthening, raising, extending, and protecting.
4. *Lower South Side Levee.*—Strengthening, extending, and protecting.

BEAR RIVER.

5. *Upper North Side Levee:*
6. Part 1—Above the railroad bridge.
7. Part 2—From railroad bridge to Long bridge.
8. Part 3—From Long bridge to near Oakley's, strengthening, raising, extending, and protecting levee.
9. *Lower North Side Levee.*—(Work deferred.)
10. *Upper South Side Levee.*—Construction and protection.
11. *Lower South Side Levee.*—Strengthening, raising, extending, and protecting.
12. Clearing brush throughout the river bottom at certain localities.

The Directors may reject bids for any part of any job, and accept those for any part, in their discretion.

WM. H. HALL, State Engineer.

SET No. 5.—FEATHER RIVER WORK.

Specifications for the closing of Humphreys' Break.

This is a crevasse in the west bank of the Feather River and the levee thereon, upon the properties of J. W. Humphreys and W. J. Sliger, Sections 23 and 25, T. 13 N., R. 3 E., about sixteen miles below Yuba City.

The total length of the open cut is 580 feet. In reconstructing the levee to effect its closure, the maximum fill will be 13.8 feet (net) in depth, the average depth of fill, from 8 to 9 feet; and to complete this closure and reconstruct the levee immediately adjacent for a total length of 630 feet, about 8,150 cubic yards of material will be required after settlement.

In addition to this, to repair 300 feet of levee above the break, about 300 cubic yards, and to repair 1,900 feet of levee below the break, about 5,000 cubic yards of material will be required.

A small bulkhead of stakes, boards, and bags of sand, now placed across the gap, is to be removed, and all rubbish is to be cleared away from the opening, and trees, snags, stumps, and roots grubbed up before the work of closure is commenced.

The entire ground surface, where new material is to be placed, must be first well plowed and broken, and the ends of the existing levee must be pulled down to a slope of 1 on 4 to insure good junction of old and new work.

All material is to be taken from the river side of the levee, where it may be had within 300 feet of the work, and the several classes (sand, sandy loam, and clay) are to be mixed in the bank, as the engineer in charge may direct. The work is to be done with scrapers, and the bank brought up in layers, according to the directions of the engineer in charge.

The borrow ditch is not to be made over two feet deep below the natural surface of the ground, but material must be taken from outside of it where necessary.

A berm of fifteen feet must be left outside of all new work. The water slope of the new work must be one on four, the land side slope one on two and a half, and the crown eight feet wide.

For the repairing of the levee above and below the break, the foregoing directions apply also.

PROTECTION OF THE LEVEE.

The specifications for this class of work adopted for the Brown's Valley grade work apply herein.

There may be required at this point about 1,500 to 2,000 square yards of brush revetment, and 600 to 700 square yards of spur work.

MISCELLANEOUS PROVISIONS.

Laying Out and Measurement of Work—Bids for Work.

All under the above headings incorporated into the specifications for work on the Brown's Valley grade, on Yuba River, shall be applicable to the work here described, and all definitions, restrictions, and directions therein given, shall be applicable herein also; *provided, always,* that proper corrections be understood for names of localities.

SET No. 6.

Specifications for the Construction of a Levee on the West Side of Feather River through the region opposite the Town of Nicolaus.

The location of this proposed levee is from a point on the existing levee on the west bank of

Feather River, near where it crosses the line between the Bossen and the Schutz property, along the proposed new route as staked out, to the Kanaka Camp Indian mound, opposite Nelson's Point, a distance of about 14,000 feet.

The following is an estimate and description of the work:

Location.	Length—feet.	Crown Width—feet.	Height—feet.	Slopes.		Earth Work—Cubic yds.
				Water Side.	Land Side.	
Graf Slough crossing	222.4	8	18	1 on 4	1 on 3	10,508
Upper Zins Slough crossing	200	8	11.5	1 on 4	1 on 3	4,106
Lower Zins Slough crossing	200	8	14.8	1 on 4	1 on 3	6,555
Nelson's Slough crossing	200	8	14.5	1 on 4	1 on 3	6,312
Connecting levee, etc.	13,220	6	9	1 on 3	1 on 2	125,590
Total						153,071

All the material must be taken from the river side of the levee. A berm of fifteen feet must be left between the foot of the levee slope and edge of the borrow pit. The entire ground surface, where new material is to be placed, must be first well plowed and broken, and the ends of the existing levees must be pulled down to a slope of 1 on 4, to insure a good junction with the new work.

The ground is to be thoroughly cleaned of rubbish and roots, and stumps grubbed therefrom, and trenched under the center of the levee to such width and depth as the engineer in charge may direct, and when necessary in the judgment of the district engineer; provided, that trenching is to be paid for, per cubic yard, at the same price as the super-imposed earthwork.

No borrow ditch is to be made over two feet deep below the natural ground surface, but material is to be taken from where the engineer in charge may direct. The work is to be put up in layers, not exceeding one foot in thickness, with scrapers, and in the best manner, as may be directed by the Engineers.

MISCELLANEOUS PROVISIONS.

Laying Out and Measurement of Work—Bids for Work.

All under the above headings incorporated into the specifications for work on the Brown's Valley grade, on Yuba River, shall be applicable to the work here described; and all definitions, restrictions, and directions therein given, shall be applicable herein also, *provided, always,* that proper corrections be understood for name of locality.

SET No. 7.

Specifications for Works Designed to Re-form the Southeast Bank of Feather River, and Remove the Bar at the Orchards.

The location of this proposed work is along the southeast shore of the Feather River at a point about five miles in a direct line below the mouth of the Yuba River, where, during the past high water season, the bank has been cut away for about 3,000 feet of its length to an average width of 400 feet, the river showing a tendency to leave its present channel for one in the low lands on its east side.

Opposite this stretch of river bank the high water channel has a maximum width of 1,100 feet, and averages 1,000 feet for about 2,000 feet in length. It is proposed to re-form this south bank of the river so as to bring the channel between banks to a width about equal to its normal width above and below, namely, 450 to 500 feet. This is to be accomplished by the construction of spurs or jetties, out upon the sand flat from the south shore, in such manner as to produce deposits of sediments between them against the shore, thus effecting the rebuilding of the bank, and causing the bar outside of them to be scoured away by contracting the waterway upon it.

The work proposed to be done will consist of what may be called brush mattress and jetty work. The annexed sketches—"Plans for spur work, Set C"—will illustrate its special character. Referring to these, it will be seen from diagram No. 1 that a number of spurs or jetties are to be thrown out from the existing bank and the proposed levee, across the sand flats and shoals to the projected new line of bank.

Diagrams 2 and 3 illustrate the construction of these spurs or jetties as follows:

They consist of a mattress of fine willow brushwood, loaded with bags of sand as a foundation to prevent scour, surmounted by a permeable pile of loose brush, weighted down by bags of sand, through and above which rises a closely placed wall of brush, made of young saplings set upright and held in place by a pile, rail, and wire support.

In placing a spur, the bank, as it now exists, is to be sloped back for the width of the mattress, to an angle of 1 on 3 from the foot thereof, and the foundation is to be laid in one continuous mattress from the back line of the shore levee to five feet beyond or outside of the position of the outer end of the jetty or spur proper, as formed by the piling and upright brush work.

The foundation mattress is to be composed of three layers of small, pliable, green willow brush, sewed together with No. 14 (American gauge) annealed iron wire. The brush in the top and bottom layers is to be laid across the mattress, or so that it will be in the direction of the current; and that in the middle layer, lengthways with the mattress.

The brush is to be arranged so as to leave a fringe of bushy ends three feet in width all around the mattress edges.

The wire sewing is to be done in rows four feet apart, or five rows to a 24-foot wide mattress. The stitches are not to exceed 14 inches in length, and the mattress is to be drawn tightly together to a thickness of one foot. The stitching will be explained by the resident engineer.

Through the longitudinal center line of the mattresses, thus made and laid, rough, round piles are driven at ten feet intervals, so that their tops will be two fifths the elevation from the mattress surface to the plane of high water, or to an elevation of three feet above the mattress surface as a minimum. These piles are to be from eight to ten inches in diameter, driven into the ground fully half their length, or to an additional distance, which a 1,000-pound mall, falling from a height of fifteen feet, will settle them; or to a minimum depth of five feet below the ground line.

A pair of rough sapling poles, from four to six inches in diameter, are to be strapped with No. 5 old iron wire, one on each side of the piles, as rails, as shown in the diagram. These rails, thus strapped, must be firmly and strongly fastened together, but so arranged as to slide freely up or down on the piles as guides, and held to each by the ring of old wire which binds them. (See diagram.)

In line with the piles of each spur, full, brushy, young willow saplings are to be set upright, within one foot of each other, from edge to edge of trunks. The butts of these saplings are to rest upon the mattress between the poles or rails, and they are to be held upright and firmly in line by four strands of No. 5 (American gauge) iron wire, interwoven between their stems from pile to pile, and near the level of the tops thereof. The saplings in this wall are to be placed so thickly that the whole will present the appearance of a dense wall of brush, and are to be of such height as to extend 15 per cent. of their total length above the plane of high water.

Upon the mattress and beneath the rails a bed of smaller brush saplings is to be laid by placing them with their brush ends alternating up and down stream, and their butts extending through between, or in part resting against those of the larger upright saplings. This bed of brush must then be weighted down with bags of sand, disposed as shown in the diagrams, so as to remain, at the rails, from one to two feet in thickness, according to the height of the spur.

The mattress itself is to be weighted down with bags of sand, near its upper and lower edges, as shown in the diagram; and all use of sand bags for similar purposes is to be done to the extent and in the manner required by the engineer in charge.

The foregoing is a description of the construction of the jetties or spurs, as they will be for the most part constructed. In some instances the plan will be varied, so as to dispense with the upright wall of saplings in the line of the piles, and have the piles come only to the top of the sand bags used to weight down the rails and brush bed under them, in which cases the brush bed will always be made to measure two feet thick, after weighting down. And again, in some instances the foundation mattress will be dispensed with, and only the upper or loose bed of brush put in on the ground surface, to protect the base of the piles and upright wall of saplings. In this latter case, also, the bed of brush will always be laid to measure two feet in thickness at the butts, when pressed down and weighted.

It is estimated that, in all, 7,000 square yards of mattress, one foot thick after sewing, and laid in widths varying from fifteen to twenty feet, and in lengths from one hundred to six hundred feet, will be required. Further than this, work will be required as follows:

The construction of 3,000 linear feet of jetty, in all respects similar to the drawings.

The construction of 1,000 feet of jetty, similar to that shown in the drawings, but without the mattress foundation.

The construction of 1,500 to 2,000 feet, according to the modification spoken of, namely, without the upright wall of brush saplings, and with the piles extending only about three feet above the mattress surface.

The furnishing, filling, and placing of 15,000 to 20,000 old bags with sand.

MISCELLANEOUS PROVISIONS.

For about one fourth of their length these spurs will rest upon the high bank land extending from the levee to the sand flats; thence they will extend out upon these flats, for the most part now dry.

The Directors guarantee to the contractor the right to cut and remove all necessary brushwood without compensation for damage, or payment for the material; provided, that in such cutting and transportation the contractor constructs all necessary roads and causeways, and openings in fences, etc., and exercises due diligence and care to avoid unnecessary damage; and further provided, that the Directors will not be responsible for any damage occasioned by reason of the escape of stock, or the inroads of stock upon crops or pastures, which may be occasioned by the openings in fences made by the contractor, or in any way by the occupation of premises by him.

The brush cutting shall be conducted under the direction of the engineer in charge, and at such points and off from such ground as he may direct; provided, that none at points materially nearer to the location of using can be had; and provided further, that in no case shall brush be cut where, by reason of so doing, an existing levee, or one to be built or repaired by the Board of Directors, shall be exposed to the wave action, or wash by the currents at flood periods.

The Directors guarantee to the contractor the right of way for the transportation of all material on such routes as may be reasonably practicable; and on conditions, as respects liability for damages, similar to those already inserted in the section concerning brush cutting.

All brush cut in the prosecution of this work, and remaining unused at its completion, or forfeiture of contract, is to revert to the Board of Directors; and the contractor is not to lay claim after the work is done, to any peculiar privileges of right of way, or right to material of any kind, other than his plant of tools and appliances, which may be removed from the premises.

LAYING OUT AND MEASUREMENT OF WORK.

This work is to be staked out by the resident engineer, under direction of the State Engineer, and is to be carried forward to the satisfaction of the engineers and the Board of Directors of the district.

All extra work of any class herein specified, which the contractor may undertake, performed on the Feather River, shall be done at contract prices, on the measurement thereof.

Measurement of brush mattresses to be made by the square yard, within lines two feet outside of the outer rows of stitching, and to a line similarly situated with respect to the tips of the brush on the ends of the work.

Measurement of spurs or jetties to be made, for the upright pile and sapling work, by the square yard, from the mattress (or ground, when no mattress,) surface to the plane of high water; for the loose bed of brush laid horizontally, by the linear foot, laid to an average thickness of one and a half feet, and a width corresponding with that of the mattress, as shown in the drawings, exclusive of the piles and rails, when the upright wall of brush is to be used and measured; and inclusive of the necessary piles and rails, when the upright wall of brush is not to be used.

The bags of sand used in weighting the brushwork are to be counted.

The plane of the sand flat is from ten to fifteen feet below that of high water, and the bank land is one to four feet below the high water plane.

About 500 piles, ranging from ten to thirty feet in length, will be required in this work, and the total length of piling will be about 8,000 to 10,000 feet.

Work is only to be accepted, approved, and taken off the hands of the contractor upon the final completion, in all respects, of all to be done at this locality, on both sides of the river.

In case of any undue settling of any part of the work, after completion of that part, its integrity is to be preserved in such manner as the State Engineer may specify, or the resident engineer may direct.

All differences between the contractors and the Board of Directors are to be settled by the Board of Directors, in their discretion.

BIDS FOR WORK.

The work to be executed under these specifications is classified as follows:

1. *Sewed mattress work.*
2. *Vertical brush wall work.*
3. *Horizontal brush bedding work, exclusive of piles and rails.*
4. *Horizontal brush bedding work, inclusive of short piles and rails.*
5. *Sand bag weighting.*

Sewed mattress work includes the furnishing of all labor, material, and transportation to make and lay the mattresses as specified.

Vertical brush wall work includes the furnishing of all labor, material, and transportation to drive the piles, erect and fasten the brush wall as specified.

Horizontal brush bedding work, exclusive of piles, includes the furnishing of all labor, material, and transportation to lay the bedding of brush as directed.

Horizontal brush bedding work, inclusive of piling, includes the furnishing of all labor, material, and transportation to lay the bedding as described, and fasten it down with piles and rails as specified.

Sand bag weighting includes the furnishing of all labor, material, and transportation necessary to weight down the brush with well sewed, fairly good, second-hand grain bags, as may be directed by the engineer in charge.

Bids are desired for the work as follows:

For sewed mattress work: Per square yard, measured as specified.

For vertical brush wall work: Per square yard, measured as specified.

For horizontal brush bedding work—without piles and rails: Per linear foot, measured as specified.

For horizontal brush bedding work—with piles and rails: Per linear foot, measured as specified.

For sand bag weighting: Per bag laid in position, as directed.

SET No. 8.—AMERICAN RIVER WORK.

Specifications for Works Designed to Re-form the South Bank of the American River, and protect the North Levee of the City of Sacramento at a certain locality.

The location of the proposed work is along the American River frontage of the property known as Smith's Gardens, where, during the past Winter, the bank has been swept away to a width of 100 to 200 feet, and for about 1,500 feet in length; the river showing a tendency to leave its present channel and adopt a course close against the Sacramento City levee.

The work proposed to be done will consist of what may be called brush mattress and jetty work. The annexed sketches will illustrate its special character. Referring to these, it will be seen from diagram No. 1, that a number of short spurs or jetties are to be thrown out from the existing bank into the channel to the proposed line of new bank; that these spurs extend back upon the bank to a wall of brush and earth which joins their rear ends in a line about parallel with the bank, and thirty feet therefrom.

Diagrams 2 and 3 illustrate the construction of these spurs as follows:

They consist of a mattress of fine willow brushwood, loaded with bags of sand as a foundation to prevent scour, surmounted by a permeable wall of young saplings resting against rough pole stringers or rails, supported by piles driven at short intervals through the mattress for its entire length.

In placing a spur, the bank as it now exists is to be sloped back for the width of the mattress to an angle of one on three, from the foot thereof, and the foundation is to be laid in one continuous mattress from the back line of the shore levee of brush and earth to five feet beyond or outside of the position of the outer end of the jetty or spur proper, as formed by the piling and upright brush work.

The foundation mattress is to be composed of three layers of small, pliable, green willow brush, sewed together with No. 14 (American gauge) annealed iron wire. The brush in the top and bottom layers is to be laid across the mattress, or so that it will be in the direction of the current, and that in the middle layer lengthways with the mattress.

The brush is to be arranged so as to leave a fringe of bushy ends three feet in width all around the mattress edges.

The wire sewing is to be in rows four feet apart, or five rows to a twenty-four foot wide mattress. The stitches are not to exceed fourteen inches in length, and the mattrass material is to be drawn tightly together, to a thickness of one foot. The stitching will be explained by the resident engineer.

Through the mattress thus made and placed, rough round piles, averaging ten inches in diameter, are to be driven as far as an eight hundred-pound maul, with a fifteen-foot fall, will drive them, or to a maximum depth of fifteen feet.

These piles are to be in a row ten feet from the lower edge of the mattress, spaced ten feet apart in the rows, and are to stand three feet above the high water line of 1880, as shown on the diagrams.

Three rough sapling poles, six to eight inches in diameter, are to be notched in and spiked against the piles as horizontal rails, from end to end of each row, equidistant, and from the elevation just above the plane of low water to two feet above the plane of high water, and on the up stream side of the piles.

Resting against these rails, on the up stream side, an open-work wall of brushwood is to be built with young saplings of willow or cottonwood, not over four inches diameter at the butts.

Most of these saplings are to be placed vertically, with the butts up in the air, the brush ends down, and bent flat against the mattress for at least one third of their length. Others are to be placed in the reverse position, so as to give the entire wall of brush a decidedly bushy appearance, and thickness of about one foot, in a loose state. All saplings are to be lashed to each rail with old wire, or other material, which will hold them firmly in place.

The whole structure is to be loaded with old grain bags filled with sand, and sewed, so as not to spill their charge, to the extent of three sand bags, on the average, to each linear foot of mattress laid, as the engineer in charge may direct.

The shore ends of the jetties thus constructed are to be joined by a wall of brush four feet high, when firmly pressed down, composed of young bush saplings, six to twelve feet in length, set with their butts toward the stream, and buried in a trench two feet deep and four feet wide, and leaning back towards the land.

MISCELLANEOUS PROVISIONS.

During this season there is water running along where it is proposed to construct these spurs, to a depth of two or three feet, but it is not necessary to turn it in order to do the work under these directions.

The brush and trees necessary to construct this work are to be cut from the thickets in the neighborhood, but in no case is the ground to be stripped of all brush growing upon it, for a space greater than fifty feet in width, and between such spaces other belts of timber or brush, to an equal width, are to be left standing at right angles to the direction of the current, or as the engineer in charge may direct.

The Directors guarantee to the contractor the right to cut and remove all necessary brushwood, without compensation for damage or payment for the material; *provided,* that in such cutting and transportation, the contractor constructs all necessary roads and causeways, and openings in fences, etc., and exercises due diligence and care to avoid unnecessary damage; *and further provided,* that the Directors will not be responsible for any damage occasioned by reason of the escape of stock, or the inroads of stock upon crops or pastures, which may be occasioned by the openings in fences made by the contractor, or in any way by the occupation of premises by him.

The brush cutting shall be conducted under the direction of the engineer in charge, and at such points and off such ground as he may direct; *provided,* that none at points materially nearer to the location of using can be had; *and provided further,* that in no case shall brush be cut where, by reason of so doing, an existing levee, or one to be built or repaired by the Board of Directors, shall be exposed to the wave action or wash by the currents at flood periods. The Directors guarantee to the contractor the right of way for the transportation of all material on such routes as may be reasonably practicable, and on condition, as respects liability for damages, similar to those already inserted in the section concerning brush cutting.

All brush cut in the prosecution of this work, and remaining unused at its completion or forfeiture of contract, is to revert to the Board of Directors; and the contractor is not to lay claim, after the work is done, to any peculiar privileges of right of way, or right to material of any kind other than his plant of tools and appliances, which may be removed from the premises.

LAYING OUT AND MEASUREMENT OF WORK.

This work is to be staked out by the resident engineer, under the direction of the State Engineer, and is to be carried forward to the satisfaction of the engineers and the Board of Directors of the district.

All extra work of any class herein specified, which the contractor may undertake, performed on the American River, shall be done at contract prices on the measurement thereof.

Measurement of brush mattresses to be made by the square yard, within lines two feet outside of the outer rows of stitching, and to a line similarly situated, with respect to the tips of the brush, on the ends of the work.

Measurement of brush spurs or jetties to be made according to average vertical height, from the mattress upper surface to the lower edge of the toprail or stringer.

Measurements of the brush wall joining the ends of the spurs on the bank to be made by the linear foot.

The bags of sand used, to be counted.

Work is only to be accepted and approved, and taken off the hands of the contractor, upon the final completion, in all respects, of all to be done along the frontage contracted for.

In case of any undue settling of any part of the work after the completion of that part, the integrity of the work is to be preserved in such manner as the State Engineer may specify and the Board of Directors direct; and consequent differences between the contractor and the Board of Directors are to be made by the Directors, in their discretion.

BIDS FOR WORK.

The work to be executed under these specifications is classified as follows:

(1.) Brush mattress work.
(2.) Pile and brush spur work.
(3.) Brush and earth wall or levee.
(4.) Ballasting or weighting with sand bags.

The *brush mattress work* includes all labor and material that may be necessary in cutting, transporting, arranging, and sewing the brush into mattresses, and putting these in position where required.

The *pile and brush spur work* includes all labor and material in brush cutting and transportation that may be necessary in constructing the spurs as herein described, exclusive of the mattress foundation work, of which a separate item is made.

The *brush and earth wall or levee work* includes all labor and material necessary in cutting, transporting, arranging, and partly burying the brush necessary in completely forming the wall described.

The *ballasting* includes all labor and material, etc., necessary in ballasting the mattresses with bags of sand.

Bids are desired for the work as follows:

For mattress work: Per square yard, measured as aforesaid.
For spur work: Per square yard, measured as aforesaid.
For brush wall work: Per linear foot.

SET No. 9.—SACRAMENTO RIVER WORK.

Specifications for the Construction of an Escape Weir in the English Break.

The crevasse known as the *English break* is a washout through the west bank of the Sacramento River, about four miles above the Sacramento and Yolo railroad bridge.

The levee is destroyed for about 525 feet in length, and a crevasse 24 1-10 feet in depth is cut through the natural bank for an average width of 132 feet. Upon the plane of the natural bank level this break is about 180 feet in length.

It is desired to secure this crevasse from further enlargement, and to bring its bottom line up to a level about five feet below full flood stage in the river.

For this purpose a dam of small trees and brush, built after the plans and specifications originally drawn for the dams contracted for on the Yuba and Bear Rivers by the Directors, is to be built across the opening on a line well behind the deep cut and connected with the levee above and below it by means of an embankment of earth.

The accompanying plans will illustrate the general disposition of the work and the arrangement of its important details.

THE LINE.

How indicated.

The alignment of the work is shown on accompanying drawings, and will be marked upon the ground by suitable stakes placed and marked by the resident engineer.

GENERAL FEATURES OF DAM.

The main features of the proposed structure are to consist in two sections of levee to be placed nearly at right angles to the main levee upon the bank of the river, and terminating in abutments with wing bulkheads, to protect the extremities from abrasion. The intervening space between the bulkheads is to be filled with a brush dam of from four to six feet in height above the average level of the present surface, the center of the crest of the dam to be upon an arc of about 372 feet radius.

CHARACTER OF DAM.

The general character of the dam is to be the same as those specified and contracted for in the Yuba and Bear Rivers, with slight modifications, as indicated upon the accompanying drawing, upon which the crest line and sections of the dam, with measurements, are shown.

LONGITUDINAL DISPOSITION OF THE DAM.

Crest line.

The dam must be so constructed that its crest, as represented by the upper edges or corners of all the tree butts which end at the top surface throughout the width thereof, on completion and final acceptance of the work, shall be within four tenths of a foot of one level plane. All allowances for settlement must be agreed to by the contractor before and during the construction, as the exact circumstances of foundation and character of material are ascertained; the work must be so done, at the contractor's risk, that the elevation of the crest upon final completion will be maintained within the the above limits.

Alignment of crest.

Upon completion and acceptance of the dam, the alignment of the down stream edge of the crest must nowhere deviate more than one foot from the line traced upon the ground by the resident engineer, and the overfall face must be on a uniform slope of about 45°, as shown in the drawings.

Shaping ground.

According to the conformation of the surface of the ground and the material upon the line, the foundation of the dam is to be laid in level benches at depths below the general surface of the adjacent ground, approximating closely to those shown in the diagram of cross sections. The exact grade of each bench or division will be determined by the resident engineer before or during the work of construction, when the character of the material and the shape of the surface becomes known.

Crest and slope.

When finally completed and accepted as a whole, the crest (as before defined) of the dam shall nowhere vary more than four tenths of a foot from a level plane across it. The trees on the up stream face of the dam must lie in a plane within five degrees of the slope of one foot vertical to two feet horizontal, and its down stream face must lie in a plane within five degrees of a slope of one foot vertical to one foot horizontal (45°).

The lower apron.

The plane of the lower apron in each longitudinal bench division of the work must be within two tenths of a foot of the grade set for it.

FOUNDATION OF THE DAM.

Divisions and subdivisions of the work.

Upon making the definite location of the site of the dam, the resident engineer will lay out the work in divisions, each of which shall be at least one hundred feet in length, and subsequently the foundation is to be laid down in each of such divisions as a whole, or in such subdivisions as may be deemed best by the engineer.

EXCAVATION.

Mode of progression in the work.

For at least one half of such division or subdivision, as the case may be, the excavation is to be made complete to the determined sub-grade before the laying of the brush is commenced within the same.

Disposition of spare material.

The work of excavation may be carried on by any method which suits the contractor's convenience. Spare material must not be left in a continuous ridge below the apron, but such ridge, if made in the progress of the excavation, must be broken through at intervals of one hundred feet, and free passage for the water must be provided on a level with the top of the adjacent portion of the apron for at least one half of every subdivision of the work.

Extra depth for foundation.

In case where the material found in excavation is not such as, in the opinion of the engineer in charge, it is desirable to build upon, the contractor will be required to continue the excavation, if necessary so to do, to as much as twice the depth originally designated on the profile and cross sections, and build the structure thereon at the contract rates for the work; *provided*, that no excavation shall ever exceed six feet in depth in the average for any one hundred feet of foundation.

Sub-grade.

In general, the sub-grade of the structure, being the ground surface upon which it is to rest, is to be disposed, as shown in the sectional drawings and longitudinal profile hereafter to be made.

THE STRUCTURE.

Upon the ground surface thus shaped and prepared, the structure is to be built in the following manner:

The lower apron.

The lower apron, laid entirely beneath the average plane of the ground's surface, is to be first built in each division or subdivisions of the work.

Composition of the structure.

It is to be composed of small trees, ranging from 20 to 30 feet in length in the average-sized structure, and of a greater or less length, as may be required, in the longer or smaller cross sections, and from 4 to 7 inches in diameter at the butt, laid closely together lengthways up and down the stream, in horizontal layers, separated by smaller poles, planted three feet apart and parallel with the line of the dam, the whole to be consolidated and filled in with smaller brush and such spare material as is being moved, which may be indicated by the engineer in charge.

Fastening together of the structure.

The poles of each set are to be spiked solidly down upon the tree trunks below, and the trees of each layer are to be well spiked to the poles upon which they rest.

Tree nails of hard wood may be used in this fastening, or iron spikes of sufficient length to take a hold of at least two and a half inches, may be used.

Heavy stakes are to be driven as firmly as can be done with a ten-pound sledge, five feet apart, through and along the upper edge of the apron, to which the poles and trees must be firmly secured.

The lower apron.

The upper apron, laid partially below and partially above the natural surface of the ground, is to be next built, in each division or subdivision of the work; this apron rests partly upon the lower apron and partly upon the ground above.

COMPOSITION OF THE STRUCTURE.

It is to be composed of the same class of materials as the lower apron, and laid in the following manner: small trees or trunks of trees, varying from 15 to 20 feet in length for the average-sized structure, and of a greater or less length for the larger or smaller sections, and from 6 to 7 inches in diameter at the butt, are to be laid closely together lengthways up and down stream, in layers sloping downwards and retreating up stream, the butts exposed in the down stream edge of each layer, covered or buried at the up stream edge for the greater portion of their length. Alternating with these layers of trees, poles of a smaller diameter are to be laid, three feet apart, crossing the trees substantially at right angles.

The intervening spaces are to be well filled and consolidated with small brush and such spare material as is being moved, which may be designated by the engineer in charge.

Fastening together of the structure.

The poles of each set are to be solidly spiked down upon the tree trunks below, and the trees of each layer are to be well spiked to the poles upon which they rest. Proper attention is to be paid to keeping the poles of all the work over each other at regular intervals.

Tree nails of hard wood may be used in this fastening, or iron spikes of sufficient length to take a hold of at least four inches may be used. Heavy stakes are to be driven as firmly as can be done with a 10-pound sledge, 5 feet apart, through and along the upper side of the work, to which the poles and trees must be firmly secured.

THE DAM PROPER.

The dam, resting partly upon the up stream edge of the upper apron, partially upon the ground's surface next above, and partially in a pit at the upper edge, is to be next built in each division or subdivision of the work.

Composition of the structure.

In its composition and the arrangement of its parts it is similar to the upper apron. Small trees or trunks of trees 14 to 18 feet in length, and 6 to 8 inches in diameter at the butt, are to be laid closely together lengthways up and down stream, in layers sloping downwards in an up stream direction, the butts exposed on the down stream edge of each layer.

Alternating with these layers of trees, poles of a smaller diameter are to be laid, crossing the trees substantially at right angles. Care must be observed that the trees in each layer shall be laid radially as may be.

The intervening spaces between the trees and layers are to be well filled and consolidated with small brush and such other spare material which is being moved, and may be designated by the engineer in charge. In this manner the dam is to be built up to the intended elevation of its crest. and then trees of a larger diameter, and 25 to 30 feet in length, are to be used as shown in the sectional drawings, with their butts in rows forming the crest of the dam, their trunks sloping downward up stream at a slope of about one vertical to two horizontal, their tops buried in the pit and incorporated with brush and earth as in other cases provided.

BACKING.

Earth.

On the up stream face of the dam, and on the top thereof, a back of such material as may have been excavated from the pit beneath is to be placed as shown in the sections in amount varying with the height of the dam, as follows: For a four-foot dam, one cubic yard per linear foot; or a six-foot dam, one and a half cubic yards per linear foot.

Sand bags.

At the discretion of the Board of Directors a layer of good, second-hand grain sacks, filled with sand, and strongly closed by sewing, may be used either to supplement or as a substitute for the earth backing to an extent of at least three sand bags for each linear foot of dam.

ABUTMENTS.

At each end of the overfall of the dam, at the junction with the projecting levee, will be constructed an abutment of timber and plank, as shown in the drawing, and to be well filled with sand bags, earth and brush.

The surface of the ground beneath each abutment is to be excavated to a depth of three feet below the natural surface. The ends of the dam are to be well built into the abutment, and firmly secured to the timbers which comprise its frame. The planking on the end next the dam is to be of 3-inch sound plank, and is to be well fitted around the projecting end of the dam.

The frame is to be made of 8-inch square timber, driven at least 8 feet into the ground, if it be possible so to do, and 3 feet from center to center, as shown in the drawing.

The face and rear of the abutment are to be planked with 2-inch sound plank.

A compartment is to be formed at 10 feet from the end of the abutment by driving 8-inch timbers 8 feet in the ground, and well planked on each side with 2-inch sound plank placed diagonally.

The interior of the abutment is to be ceiled with 2-inch sound plank, well spiked on diagonally. All spikes are to hold at least 4 inches into the timbers.

The interior of the abutment is to be solidly filled with two tiers of sand bags piled against the walls, the interior space being solidly filled with earth and fine brush; the space between the outer planking and inner ceiling is to be well packed with fine brush and straw.

Wing bulkheads are to be built to protect the face of the ends of the levees, as shown in the plans, and formed by driving six-inch square posts, three feet from center to center, not less than five feet into the ground, if possible, faced with two-inch sound plank, well spiked on with six-inch spikes.

The brush work of the dam and aprons is to be well extended and secured to and around the bulkheads, as may be directed by the engineer in charge.

EARTHWORK LEVEE.

General description.

At each end of the dam, and to connect it with the main line of levee, are to be constructed earth embankments or levees, with a width on top of eight feet, and slopes of five horizontal to one vertical, on the face or water side, and two and one half horizontal to one vertical, on the bank or land side, as shown in the plan. The work is to be done with scrapers, in 1 foot layers, as directed by the engineer in charge. The height of the crown of these levees will be about 10 feet above the natural surface of the ground.

The crown of the old levee, for a distance of 200 feet on each side of the break, is to be re-formed, and raised to correspond with the grade of the sections of the levee to be built.

PROTECTION OF THE LEVEE.

Brush revetment.

At places where protection is needed, and to be designated by the resident engineer, a brush revetment shall be placed upon the water slope of the levee, from its base to within three feet of its crown height, and may be completed for the full width of the face, or partially, as circumstances may require.

A layer of small brush, of an inch or less in diameter, is to be first laid down, with the pieces placed longitudinally in a horizontal position with the length of the levee, to a depth of three inches, when well pressed down; upon this a layer of larger saplings is to be placed lengthways up and down the face of the levee to the same depth.

On this mattress, rows of sapling poles of a larger size, less than three inches in diameter at the butt, placed three feet apart, after being firmly pressed down, are to be pegged through to the soil below, by crossed pegs or stakes of similar material, three feet in length, driven at six feet intervals on each row.

For this manner of securing the mattress may, at the discretion of the engineer, be substituted stout stakes three feet long, driven in rows three feet apart, at intervals of five feet in each row, having No. 14 iron wire extending from stake to stake and wound securely about their tops.

Brush spur work.

At right angles to the line of the embankment, or upon such other alignment, and at such intervals as the engineer in charge may lay down, brush spurs are to be constructed, extending from the face of the levee to the river bank, a distance of about ninety feet.

The drawings hereto attached, illustrate the general style of these constructions, which may be described as that of inclined open work walls of brush, supported on a string piece or ridge pole resting in a crotch of small, rough timber cross horses placed at convenient intervals.

Cross section B shows the manner of bracing these spurs, which are to be about eight feet high at the highest place. The horses and bracing shown by the elevation and section are to be placed at twelve feet intervals in the line of the spurs, and string pieces are to be laid from one to the other, and to the levee or river bank, as shown in the elevation.

The pieces constituting the horses and bracing are to be well spiked together with iron cut spikes, reaching all the way through the two at each crossing.

If made of round, rough timber, they should be roughly flattened at each crossing, with an ax, to make a clear fit and facilitate nailing.

The pieces A in the plan of the brush wall, next to and on each side of the cross horse heads, are to be spiked to them and to the ridge pole, with long spikes, at each bearing; as also pieces B to be laid on each side of the frame and stake pieces of each frame or "bent," as the whole taken together may be called. Between the bents thus placed and constructed the open brush wall is to be built, sloping in the plane of the piece A, and made of brush saplings or small trees varying in length from 15 to 35 feet, according to the size of the spur, placed at intervals of about three times the average thickness of their trunks, and alternately with their butts up and down, resting upon the ridge pole.

The lower end of these trees or saplings constituting the up stream toes of the spur are to be buried for 6-10 feet of their length, according to the size of the work, in a trench 3 feet in depth.

All the materials used in these structures, excepting the ridge poles, stake, and cross horse pieces, must be used without trimming or dragging off the small branches.

The ridge poles, stakes, etc., may be of sawed lumber, squared to the smaller dimensions given for the round timber.

If the pieces used in the face of the brush wall be not well covered with small branches, then smaller brush is to be interwoven so as to produce a decidedly brushy appearance.

There will be about 450 feet of this spur work, averaging 6 feet in height, equivalent to 300 square yards, measured as hereinafter provided.

LAYING OUT AND MEASUREMENT OF THE WORK.

Engineering supervision.

The work is to be staked out by the resident engineer, under the direction of the State Engineer, and is to be carried forward to the satisfaction of the engineers and the Board of Directors of the district.

Extra work.

All extra work of any class, except excavations below the limit herein specified, is to be done at contract prices upon measurement thereof.

Agreed measurement.

Measurement of work is to be agreed upon by the contractor and resident engineer upon each division thereof before the work is laid in.

Measurement of brush revetment and spurs.

Measurement of brush revetment is to be made in place, according to the average width and total length of work laid. Measurement of brush spurs is to be made according to the average vertical height from the ground surface, as formed to the lower edge of the ridge pole in each section and the total length constructed.

Acceptance of the work.

Work is only to be accepted and approved and taken off the contractor's hands upon the final completion of the entire structure.

Final adjustments.

In case of any undue settling of any part of the dam after the completion of that part, the integrity of the work is to be preserved in such manner as the State Engineer may specify and the Board of Directors may direct, and consequent differences between the contractor and the Board of Directors are to be determined by the Directors, at their discretion.

Prosecution of the work.

The work is to be prosecuted from its two ends simultaneously, and with all due diligence and dispatch, and brought forward in the manner and order directed by the engineer in charge.

BIDS FOR THE WORK.

The work to be executed under these specifications is classified as follows:

1. Excavation for foundation.
2. Brush and timber work.
3. Earth backing.
4. Sand-bag backing.
5. Earth embankment or levee at each end of the dam, connecting it with former levee.
6. Abutments.
7. Brush revetment.
8. Brush spur work.

Excavation will include the removal and disposal of all material to be handled in preparing a foundation for the dam and abutments.

Brush and timber work will include the cutting, transportation, and furnishing of all brush and timber, the laying of these materials, and the completion of the structure composed of them as before specified.

Earth backing includes the furnishing and depositing of this material as provided.

Sand-bag backing includes furnishing the sacks, filling, securing, and depositing them, as directed and provided for the backing of the dam and the filling of the abutments, including the packing of fine brush and straw or hay in the interstices.

Earth embankment includes the construction of about 400 linear feet of earthwork levee at the ends of the dam, connecting the abutments with the main levee, together with the reforming and raising the crown of the old levee as specified. It will require about 5,000 cubic yards of material.

Abutments include furnishing all timber, plank, and other materials, and constructing the same as shown in plan and described in these specifications for the proper construction of the abutments and the wing bulkheads which face the extremities of the levees.

Brush revetment includes all that may be necessary in furnishing, cutting, transporting, laying, and pinning down the brush as specified.

Brush spur work includes all that may be necessary in furnishing, cutting, and transporting the materials and constructing the spurs as specified.

SUMMARY OF WORK—ESTIMATED QUANTITIES.

Levee embankment	4,860 cubic yards.
Dam—Excavation	2,850 cubic yards.
Timber and brush work	4,434 cubic yards.
Earth backing	650 cubic yards.
Sand bags	1,500 bags.
Abutments—Excavation	54 cubic yards.
Lumber	23,000 feet, B. M.
Sand-bag filling	4,000 bags.
Brush revetment	800 square yards.
Brush spur work	300 square yards.

BIDS ARE DESIRED FOR THIS WORK, AS FOLLOWS:

For excavation—Per cubic yard, measured in the pit.

For brush and timberwork—Per cubic yard, measured in the work. (Predetermined allowances for settlement not to be counted in.)

For earth backing—Per cubic yard, measured in place on completion of the work.

For sand-bag backing—Per bag filled, secured, and deposited.

For earth embankment—Per cubic yard, measured on completion. (Predetermined allowances for settlement not estimated.)

For brush revetment—Per square yard, measured on the face of the embankment.

For brush spur-work—Per square yard in the vertical plane under the ridge pole and above the ground line.

SET No. 10.

Specifications for the Closing of Todhunter's Break.

This is a crevasse in the west bank of the Sacramento River, and the levee thereon, opposite the mouth of the American River.

The total length of the open way through the levee is 630 feet. A pit, 119,900 feet in area, 20 feet in depth below the natural surface of the ground on the average, with a maximum depth of 43 feet, and an average width of 190 feet, extends the entire length of the opening in the levee. This pit is situated so that the line of the old levee extends directly across it longitudinally; its sides are nearly perpendicular, and there is from 3 to 38 feet of water in it at the present time, averaging 15 feet deep.

Outside the pit, and all along outside of the borrow ditch of the levee, up stream and down stream from the crevasse, a dense thicket of young cottonwood and willow trees extends to the river bank, about 200 feet distant.

The ground's surface between the river bank and the pit in the crevasse is about three feet higher than it is behind the crevasse—on the land side of it.

This opening may be closed with an embankment on either one of three routes, namely: 1. Filling the pit and rebuilding the levee on the old line. 2. Constructing a new levee from end to end of the old one, on a line between the pit and the river. 3. Constructing a new levee around the pit by way of the opposite or land side.

The Directors desire bids on this work by each of the plans named, as follows:

1. Rebuilding levee on the old line. Completely fill the pit with material taken from the flat between it and the river, not nearer than 100 feet from the edge of the crevasse, and build thereon, with additional material from the same source of supply, a levee 12 feet high, with crown width of 8 feet, outside slope 1 on 4, inside slope 1 on 2½.

Material required: Filling the pit, 32,442 cubic yards; making embankment, 650 feet, 13,580 cubic yards.

The levee is to be laid up in layers not exceeding 1 foot in thickness, and the material may be transported by whatever means the contractor may select.

No borrow pit to be over three feet in depth. The flat from where the material is taken must not be cleared for more than half of its area, and the trees are to be left standing in belts 50 feet in width between the borrow pits, as will be marked out by the engineer in charge.

2. *A new levee around the pit on the river side.*

Build a new levee around the pit and between it and the river, joining the old levee about 100 feet above and below the edge of the pit.

By this route the levee would be about 1,050 feet in length, have an average height of about ten feet, and maximum height of thirteen feet, a crown width of six feet, with slopes the same as those adopted for the first plan.

Material required, 14,972 cubic yards.

This levee must be put up with scrapers.

A new levee around the pit on the land side.

Build a new levee from a point on that already existing, 100 feet south of the crevasse, around the pit on the inside or side furthest from the river, to a point similarly situated 100 feet north of the crevasse.

By this route the levee would be about 1,100 feet long, have an average height of about fourteen feet, a crown width of six feet, with slopes the same as in the first case.

Material to be moved, 29,374 cubic yards.

This embankment must be made from material taken from the land between it and the pit, and thrown up with scrapers in layers not to exceed one foot in thickness.

MISCELLANEOUS PROVISIONS.

The Directors undertake to secure the right of way for the work; the right to take and use all material, such as earth or brushwood, which may be necessary for the work specified; the right of way for its transport to the point of use, and the right of way for passage between the work and the public highways; *provided*, that the contractor constructs all necessary roads and causeways, openings in fences, etc., and exercises due diligence and care to avoid unnecessary damage; *and further provided*, that the Directors will not be responsible for damages occasioned by reason of the escape of stock, or the inroads of stock upon crops or pastures, which may result from any act or omission of the contractor or his employés.

LAYING OUT AND MEASUREMENT OF WORK.

This work is to be staked out by the resident engineer, under direction of the State Engineer, and is to be carried forward to the satisfaction of the engineers and Board of Directors of the district.

All extra work of any class herein specified, which the contractor may undertake. performed on the same side of Sacramento River, shall be done at contract prices on the measurement thereof.

All earthwork shall be completed to depths of one tenth over true grade line, to allow for settlement, and measured only to grade.

Measurements of earthwork used in or added to levees, to be made in the pit from which excavated, or on the bank upon which placed, as may be most convenient to the engineer in charge, or as the resident engineer may direct.

Work is only to be accepted and approved, and taken off the hands of the contractor, upon the final completion, in all respects, of all contracted for under these specifications.

In case of any undue settling of any part of the work, after the completion of that part, the integrity of the work is to be preserved in such manner as the State Engineer may specify and the Board of Directors direct, and consequent differences between the contractor and the Board of Directors are to be made by the Directors, in their discretion.

BIDS FOR WORK.

Bids are requested for this work as follows:

1. Filling pit and building levee thereon, per cubic yard, measure in place, with allowance of one tenth in elevation for settlement.
2. Constructing levee around the pit, by the outside or river side line, per cubic yard.
3. Constructing levee around the pit, by the inside or land side line, per cubic yard, etc.

SET No. 11.

Specifications for Re-forming and Protecting the Bank of the Sacramento River at a Certain Point.

The location of this proposed work is along the west shore of the Sacramento River, at the upper limit of the Town of Washington, commencing about 700 feet above the Sacramento and Yolo bridge, and extending up stream about 700 feet.

The bank at this point, and extending up to a point opposite the American River, 2,500 feet above, has been washing away regularly at each period of high water for some years in the past.

Where the present work is contemplated, various efforts have been made to stop this wearing away. An old barge was sunk against the levee face; a wing-dam of piles and lumber was thrown out; the bank was protected by piling, with brush filling and backing, and a large quantity of granite rubble-stone has been dumped in to arrest the action of the current on the base of the bank.

All of these works, or the remains of them, are to be removed. The piles are to be drawn and used in the work hereafter described; the stone is to be saved and replaced in the new structure.

The ground having been thus cleared by the contractor, the works hereafter described and illustrated in the accompanying plans are to be erected.

Figure 1 shows a plan of the disposition of the work. From this it will be seen that the general idea is to protect the bank, and cause deposit where there has been erosion, by means of a permeable training wall, with barriers of similar character connecting it with the bank. The constructions are to be made of brushwood, piles, small trees, bags of sand, and the granite blocks already on the ground.

THE OUTER BARRIER OR TRAINING WALL.

On the line of the outer barrier the water is now generally 10 feet in depth, with a maximum of 15 feet, and a minimum of 7 feet.

It is proposed to lay a mattress of small brushwood, made in a manner similar to that specified for the American River and Feather River spur or jetty works, on the bottom of the river along the line of the outer barrier or training wall of this protecting system.

This mattress is to be 15 feet wide, 1 foot thick when compressed, and sewed longitudinally with No. 14 (American gauge) annealed iron wire. It is to be composed of three layers of brush; the top and bottom layers extending transversely across the mattress, with the bushy ends projecting at the edges, and the middle layer extending the lengthways of the mattress. It is to be made in a continuous mat, and laid from the stern of a scow or barge from the upstream end down alongside of a row of temporary guiding piles.

Lengthways through this mattress when laid two rows of piles are to be driven with an open space of one and a half feet between them. The piles in the rows are to be 12 feet apart, and spaced so that those in one row fall opposite the spaces between those in the other, and all are to be sawed off at an elevation about four feet above low water plane.

Between the two rows of piling thus arranged, trees 30 to 40 feet in length are to be placed as shown in elevation by Fig. 2, and in plan by Fig. 3. They are to be firmly fastened at their butts to the pile against which they rest, with No. 5 (American gauge) annealed iron wire, as may be directed, and weighted down by bags of sand firmly fastened in their tops with old cordage.

This training wall is to be 400 feet in length, extending from the bluff point 70 or 80 feet below the lower edge of the badly caved portion of the bank to a point nearly opposite the upper end of the barge as now laying on the bank, and on a line about midway between the outer edge of the barge and the old spur dyke which now may be seen about 60 to 70 feet off the shore. (See Fig. 1.)

THE BULKHEAD—RE-FORMING AND PROTECTING THE BANK.

Behind this barrier, about parallel to it and 30 feet therefrom, a bulkhead, against which to re-form the bank land, to give strength to the levee for this season, is to be constructed.

This bulkhead is to be composed of a single line of piles, driven 5 feet apart, according to alignment, for a distance of 265 feet; about the base of which 900 cubic yards of brushwood, made into bundles as hereafter described, is to be stacked and weighted down with bags of sand, as may be directed.

This line of piles is to be driven in water from 4 to 14 feet in depth, and cut off at an elevation of about 4 feet above low water, and capped with a 4x12 cap. In the line of each spur, and at every 30 feet in distance, the piles of this bulkhead are to be braced up with a cap extending from the opposite pile in the outer barrier.

Within this bulkhead, and resting against it, the bank is to be re-formed, by filling with earth obtained wherever the contractor can make arrangements to get it—but not where other portions of the levee will be exposed by reason of its removal. With this filling the levee crest is to be made 6 feet wide, and brought to a plane 1 foot higher than the levee up stream and down stream from it, and the outer slope shaped accordingly, as may be directed by the engineer in charge. About 4,000 to 4,500 cubic yards of material will be required for this filling. The whole outer face of the levee, thus temporarily re-formed on a comparatively steep slope, is to be protected from abrasion by a revetment of fine brushwood, laid on eight inches in thickness, in two layers, and firmly pinned down by stakes driven 4 feet apart, in rows 4 feet apart, with No. 14 (American gauge) annealed iron wire bound over the brush to the stakes in the row and drawn tight in the driving. This revetment is to extend from the brush base of the bulkhead to the crest of the embankment.

TRAVERSE BARRIERS—SPURS.

At intervals, as shown in the plans (see Fig. 1), the outer barrier is to be connected with a bulkhead and with the levee behind and above it, by means of permeable spurs, composed of small trees 25 to 35 feet in length, resting against a line of piles driven through a mattress and capped.

Figures 2, 3, 4, and 5 illustrate the plan of constructing these spurs.

For the jetties connecting the outer barrier with the bulkhead and shore, and for a portion of those above, or up stream from these, a mattress, sill, or foundation is to be laid as described for the outer barrier. In other cases above this sill is to be dispensed with.

Against this pile support, the trees are to be placed in some instances with their tops down, and in others with their tops up, as shown in the plans, and firmly fastened to the upper rail or cap of the support with No. 5 annealed iron wire, or the largest wire that can be made use of readily. A pair of rough rails to support the lower end of the upright trees is to be lowered below the water line to near the bottom on each support, and made use of as shown.

To each tree placed with its top down in the water, two bags of sand are to be firmly fastened in its bushy top, with old cordage, before it is put in position.

The butts of the smaller trees of the spurs which come on the bank and can be placed on dry land, are to be buried two feet deep in a trench sunk in the levee slope before the revetment of brush is laid on, and this covering is to be closely packed around their stems. Where the spurs join the bank at parts not regularly reveted, as before described, a revetment 5 feet in width on each side of them is to be laid on to protect the earth from washing away from around the saplings composing them.

PILE DRIVING.

Piles will be required on this work as follows:

Bulkhead—53 piles, 25 to 35 feet long	1,590 lin. feet.
Spurs—58 piles, 10 to 40 feet long	1,740 lin. feet.
Training wall—67 piles, 30 feet long	2,010 lin. feet.
Total	5,340 lin. feet.

They are to be first class, 12-inch, round sticks, and are to be driven half their length if necessary, or as far as a 2,000-pound ram falling from a height of 15 feet will send them without splitting them badly when ringed. The piles now at the site of this work are to be pulled, and may be used where good.

BRUSH BULKHEAD WORK.

The brush for this work must be good, pliable young willow wood, 8 to 14 feet in length, bound tightly in bundles or fascines, with No. 14 annealed iron wire, as described in the original specifications for the brush dams on the Yuba and Bear Rivers contracted for by the Directors.

It is to be cut, bound, delivered in barges or otherwise, stacked in the bulkhead, and weighted down as directed with sand-bags of sand. About 900 cubic yards, as stacked before using, will be required.

SAND–BAGS.

Fairly good second-hand grain bags, filled with sand, and well sewed, will be required, and are to be placed in weighting the mattress, the brush bulkhead and the trees, in the barriers, as may be directed. From 1,200 to 1,500 bags of sand will be required.

CAPPING.

The capping is to be spiked on with 8 to 10-inch wrought iron ship spikes, and the contractor is to furnish the spikes with the lumber. This capping is to be good, rough, square Oregon lumber.

A CABLE.

About 700 feet of twisted wire cable, half an inch in diameter, will be required and used in lashing up together the piles of the outer barrier which are not capped. The disposition and arrangement of this cable is shown by Fig. 3.

THE GRANITE BLOCKS.

The granite blocks now resting at the foot of the abraded bank are to be removed, to an extent as far as they can be taken hold of above the water line, and are to be used in weighting down the mattresses of the outer barrier and the spurs adjacent to the bulkhead. They should be loaded on to a barge before the work commences, and then placed where required when needed.

MISCELLANEOUS PROVISIONS.

The brush and trees necessary to construct this work are to be cut from the thickets outside of the levees along the river above; but in no case is the ground to be stripped of all brush growing upon it.

The brush and trees necessary to construct this work are to be cut from the thickets in the neighborhood, but in no case is the ground to be stripped of all brush growing upon it, for a space greater than fifty feet in width, and between such spaces other belts of timber or brush to an equal width are to be left standing at right angles to the direction of the current, or as the engineer in charge may direct.

The Directors guarantee to the contractor the right to cut and remove all necessary brushwood, without compensation for damage or payment for the material; *provided,* that in such cutting and transportation, the contractor constructs all necessary roads and causeways, and openings in fences, etc., and exercises due diligence and care to avoid unnecessary damage; *and further provided,* that the Directors will not be responsible for any damage occasioned by reason of the escape of stock, or the inroads of stock upon crops or pastures, which may be occasioned by the openings in fences made by the contractor, or in any way by the occupation of premises by him.

The brush cutting shall be conducted under the direction of the engineer in charge, and at such points and off such ground as he may direct; *provided,* that none at points materially nearer to the location of using can be had; *and provided further,* that in no case shall brush be cut where, by reason of so doing, an existing levee, or one to be built or repaired by the Board of Directors, shall be exposed to the wave action, or wash by the currents at flood periods. The Directors guarantee to the contractor the right of way for the transportation of all material on such routes as may be reasonably practicable, and on condition, as respects liability for damages, similar to those already inserted in the section concerning brush cutting.

All brush cut in the prosecution of this work, and remaining unused at its completion, or forfeiture of contract, is to revert to the Board of Directors, and the contractor is not to lay claim, after the work is done, to any peculiar privilege of right of way, or right to material of any kind, other than his plant of tools and appliances, which may be removed from the premises.

SUMMARY OF WORK.

Piling, 178 piles	5,340 linear feet.
Revetment of brush pinned down	375 square yards.
Brush in bulkhead	900 cubic yards.
Mattress	1,500 square yards.
Trees—large, 35 feet, 220; small, 20 feet, 150	370 in all.
Capping timber, 1,100 linear feet	4,400 ft. bd. measure.
Bags of sand	1,350 in all.
Earthwork filling	4,200 cubic yards.
Wire cable, ½ inch	700 linear feet.

LAYING OUT AND MEASUREMENT OF WORK.

This work is to be laid out by the resident engineer, under the direction of the State Engineer, and is to be carried forward to the satisfaction of the engineers and the Board of Directors of the district. All extra work of the class herein specified which the contractor may undertake, performed on the same side of the Sacramento River in the immediate neighborhood, shall be done at contract prices.

The piles are to be counted and measured after capping when driven.

The brush revetment is to be measured as laid.

The brush for the bulkhead is to be measured when tightly bound into fascines and stacked up on a barge, or on the bank before being placed in the work.

The mattress work is to be measured within lines 2 feet outside the outer rows of stitching, and to a line similarly situated, with respect to the tips of the brush, on the ends of the work.

The trees are to be counted, and are to come up to the standard of size required for the different purposes specified.

The capping timber will be measured as put into the work, board measure.

The bags of sand will be counted as accepted and put into the work.

The earthwork filling will be measured in the bank as soon as it is completed, and 10 per cent. will be deducted for future shrinkage.

BIDS FOR WORK.

Bids are desired for the work as follows:

For mattress work—Made and laid, per square yard.
For revetment work—Laid down, per square yard.
For brushwork—Laid in place, per cubic yard.
For piling—Driven and sawed off, per linear foot.
For capping timber—Fitted and spiked on, per foot, board measure.
For trees (large and small)—Placed in the work, per tree.
For sand-bags—Placed in the work, per bag.
For earthwork filling—Shaped for revetment, per cubic yard.
For wire cable—Placed in the work, per linear foot.

SET No. 12.

Specifications for Work Necessary to Re-form and Protect the Bank of the Sacramento River Opposite the Foot of V Street, Sacramento.

The location of this proposed work is at a point on the east bank of the Sacramento River, about opposite the foot of V Street, where the bank of the river has been rapidly caving away for about 400 feet of its length during the past high water period.

It is proposed to extend the city front bulkhead down in front of this point of abrasion, to refill and reshape the bank behind it, and to protect the slope from further abrasion with a revetment of brush.

THE BULKHEAD.

Piles are to be driven 10 feet apart, in a row 500 feet long. These piles will necessarily vary from 20 to 44 feet in length, and the total length required will be 1,774 feet. At the base of these piles, between and around them, a bulkhead of brush made into fascines, as specified for the work just above the Yolo and Sacramento bridge, is to be built up, using 1,300 cubic yards of brush for the purpose.

This brush bank is to be weighted down with sand-bags, or with stone laying in the crevasse, as may be directed by the engineer in charge.

The piles are to be cut off at the elevation of low water, and a 6x12-inch cap, fastened on with 12-inch wrought iron bolts. Twenty to fifty feet in the rear of each third pile for 240 feet in length of the work, an anchor piece 8x12 inches, and 10 feet long, is to be buried and stayed by two piles 15 feet long in front of it. From this to the pile in the bulkhead opposite to it, a 1-inch wrought iron rod is to extend, being passed through the timber at each end, and set up tight with washers.

RE-FORMIMG THE BANK.

Behind the bulkhead thus formed, the bank is to be re-formed by filling with earth, to be obtained from the flat outside of the levee about 300 to 600 feet below the site of the work, and the face is to be shaped uniformly to receive the brush covering.

Amount of material required, 25,152 cubic yards.

REVETMENT OF BRUSH.

The bank re-shaped as above, is to be covered with a revetment of brush, from the brush in the bulkhead at the foot of the slope to the crest of the levee. This revetment is to be laid on as specified for the work of the same class on the work just above the Yolo and Sacramento River bridge.

There will be from 3,500 to 4,000 square yards of revetment.

PILE DRIVING.

The piles required on this work will be as follows:

3	20 feet	60 linear feet.
2	22 feet	44 linear feet.
8	24 feet	190 linear feet.
5	26 feet	130 linear feet.
4	28 feet	112 linear feet.
2	30 feet	60 linear feet.
2	32 feet	64 linear feet.
2	34 feet	68 linear feet.
2	36 feet	72 linear feet.
6	38 feet	228 linear feet.
5	40 feet	200 linear feet.
3	42 feet	126 linear feet.
5	44 feet	220 linear feet.
20	10 feet	200 linear feet.
Total		1,774 linear feet.

The piles must be first class, 12-inch, round Oregon sticks, driven at least 12 feet, or as far as they can be readily settled with a 2,000-pound ram falling 15 feet, without splitting when ringed.

BRUSH BULKHEAD WORK—CAPPING.

All under the above headings incorporated into the specifications for work at the point near the Sacramento and Yolo Railroad bridge is applicable herein.

GRANITE BLOCKS.

The granite blocks now laying in the cut are to be removed at the expense of the contractor, and used in weighting down the brush of the bulkhead and the brush of the revetment, as the resident engineer may direct.

MISCELLANEOUS PROVISIONS.

All under the above heading incorporated into the specifications for work at the point near the Sacramento and Yolo Railroad bridge is applicable herein.

SUMMARY OF WORK.

Piles—69	1,774 linear feet.
Brush	1,300 cubic yards.
Capping—600 linear feet	4,800 feet, bd. measure.
Rods (braces)—10	300 linear feet.
Earthwork	25,152 cubic yards.
Revetment	4,000 square yards.

LAYING OUT AND MEASUREMENT OF WORK.

All under the above heading incorporated into the specifications for work at the point near the Sacramento and Yolo Railroad bridge is applicable herein also.

BIDS FOR WORK.

The Directors desire bids on this work as follows:
For piling—Driven and sawed off, per linear foot.
For brushwork—Laid in place, per cubic yard.
For capping timber—Fitted and spiked on, per foot. board measure.
For one-inch rod braces—Fitted into the work, per linear foot.
For earthwork—Shaped for revetment, per cubic yard.
For revetment—Laid down complete, per square yard.

UPPER SACRAMENTO RIVER WORK—SET No. 13.

Specifications for a Levee on the West Bank of the Sacramento River, from Jacinto to Colusa.

FIRST DIVISION.

A New Levee from Jacinto to the Head of the Present Glenn Levee.

Total length	7.4 miles.
Amount of material to be moved	137,000 cubic yards.
Average height of embankment	4.5 feet.

In subdivisions as follows:

DIMENSIONS AND QUANTITIES.

SUBDIVISION.	Length.	General Height.	Slopes.	Crown.	Material.
(*a*)	0.4 miles.	4.0 feet.	1 on 2 and 3	6.0 feet.	5,900 cubic yards.
(*b*)	3.5 miles.	4.5 feet.	1 on 2 and 3	16.0 feet.	77,000 cubic yards.
(*c*)	2.8 miles.	4.5 feet.	1 on 2 and 3	6.0 feet.	40,000 cubic yards.
(*d*)	0.3 miles.	5.0 feet.	1 on 2 and 3	16.0 feet.	6,720 cubic yards.
(*e*)	0.4 miles.	5.5 feet.	1 on 2 and 3	6.0 feet.	7,638 cubic yards.

DESCRIPTION OF ALIGNMENT.

Subdivision (*a.*)—Along and parallel to the high bank of the river, about 120 feet from the edge thereof, from the Town of Jacinto to the road about half a mile below. Soil, hard bank land; route, clean and open.

Subdivision (*b.*)—Along and parallel to the bluff bank of a slough or old river channel, and about 120 feet therefrom, a distance of about 4,000 feet, to the bank of the river; thence in the same manner, following the course of the river bank and roadway, continuing along the roadway after it leaves the river bank to a point about 4 miles from Jacinto, where the road turns from a southeasterly to a southwesterly direction. The levee throughout this subdivision is to be used as a roadway, being 16 feet wide on top. Soil, hard bank land; route, clear and open. There are several small slough channels to be embanked, wherein the work is to be executed with extra care.

Subdivision (*c.*)—From the turn in the road mentioned (leaving the roadway), in a southeasterly direction to a point on an east and west fence about 150 feet from the bluff bank of an old river channel; thence S. 19 E. (Mag.) 1,246 feet to a second east and west fence; thence along the westerly margin of and 120 feet from a dense growth of brushwood, to a point near Station 950 of preliminary surveys; thence south 10° west (Mag.) 600 feet across a neck of high land which extends southeasterly towards the river; thence in a southwesterly direction about parallel to the bank of an old shallow slough channel, and about 120 feet west thereof to the Princeton and Jacinto road again.

This subdivision of the work is on high bank land, open and free from growth except the first 1,800 feet, which is located through a grove of oak trees.

Subdivision (*d.*)—Along the present roadway, or parallel thereto, 100 feet to the west, across or around the washout or slough now open. This portion of the levee must be constructed for a roadway, 16 feet wide on top. Soil, high bank land; route, open.

Subdivision (*e.*)—From the road in a southeasterly direction, about parallel to several slough channels on the left to the head of the present Glenn levee.

SECOND DIVISION.

The Glenn and Razor Levees to Pinhook Lane.

Total length of work	2 miles.
Amount of material to be moved	33,000 cub. yds.
Average height of embankment	5.5 feet.

A levee already exists of dimensions about as given below. It is to be raised and increased in dimensions as follows:

SUBDIVISION.	Old or New Levee.	Length, Miles.	Height, Feet.	Crown, Feet.	Slope Out.	Slope In.	Above H. W. Feet.	Material Required, cub. yds.
(*a.*)	Present levee	1¼	3½	3	1 on 2½	1 on 1½	2	--------
	Proposed levee	1¼	5½	6	1 on 3	1 on 2	4	19,500
(*b.*)	Present levee	-------	-------	8 to 16	---------	---------	3	--------
BoundSlough	Proposed levee	-------	-------	16	---------	---------	5	1,500
(*c.*)	Present levee	¾	3	2	1 on 2½	1 on 1½	1½	--------
	----------------		5½	6	1 on 3	1 on 2	4	13,000

DESCRIPTION OF SUBDIVISIONS—WORK, ETC.

Subdivision (*a.*)—The Glenn levee, from its head to the lower point where it was raised during the past season, exclusive of the Bound Slough dam or embankment, to be raised two feet and strengthened.

The existing levee has been placed too close to the edge of the bank along which it courses, and sufficient material cannot be had on the water side, outside of a moderately wide berme, with which to raise it. Material will have to be taken from the field on the land side for this purpose, at some points, but it must be scraped off from the surface over such an area that no decided borrow-pit or ditch will be formed, and a berme 20 feet in width will be left untouched.

The addition to this levee is to be made on the land or water side, as the engineer in charge may direct, but generally material will be put on the side of the levee nearest where it is obtained.

The soil is firm alluvial upland soil, and the route is open.

Subdivision (*b.*)—The Bound Slough Dam. This embankment is now from eight to sixteen feet wide on top. It is to be raised two feet, and made of uniform width to sixteen feet throughout. Material for this purpose is to be obtained from the further side of the borrow pits already existing on the land side of the levee adjacent, and deposited on the land side of the dam, and on top thereof.

Subdivision (*c.*)—The portion of the Glenn levee not raised during the past season, and the Razor levee to Pinhook Lane, to be raised two and a half feet and strengthened.

This subdivision of the work is located even nearer to the bank in front of it than the subdivision (*a*), and material for the work is to be obtained and applied in the same manner as described for that subdivision.

THIRD DIVISION.

The Packer and Heimstreet Levees, from Pinhook Lane to the river bank, at the east and west fence, 1,200 to 1,500 feet north of Mrs. Heimstreet's house.

Total length	13,000 feet.
Material to be moved	60,000 cubic yards.
Height of embankment generally	5.5 feet.

Along or near a large portion of this route a levee exists already, but for the greater part of its length the location is so near to the slough or river bank, or the levee itself is so insignificant that it is not worth consideration.

The Packer levee, for 4,200 feet in length at the upper end of this division, is very well located. It is proposed to retain this work, strengthen and raise it, and thence to the end of the division build a new levee entirely, which will, in part, be located along and in the present roadway, and in part follow a line about 100 feet from the edge of the old channel or river bank.

The Packer levee, 4,200 feet long, 3.5 feet high, 6 feet wide on crown, water side slope 1 on 6, land side slope 1 on 3, is to be raised an average of 1½ feet throughout its length, with a 6-foot crown; outside slope 1 on 3, inside slope 1 on 2. Material required, 10,000 cubic yards. All material to be taken from the water side, leaving a berme of 15 feet.

The new levee, when located in the roadway, is to be built as a road embankment, 16 feet wide on crown, with slope on the water side of 1 on 3, and on the land side of 1 on 2. Material to be taken altogether from the water side, leaving a berme of 15 feet.

Where not located in the roadway, the new levee is to be built with crown of 6 feet in width, water side slope 1 on 3, land side slope 1 on 2, berme 15 feet in width. All material to be taken from the water side. Material required, 50,000 cubic yards.

FOURTH DIVISION.

The Heimstreet, Glenn, and McDaniel levees, from 1,500 feet above Mrs. Heimstreet's house to the Princeton levee:

Total length	6,900 feet.
Material to be moved	34,800 cubic yds.
Average height of embankment	5 feet.

There is now a levee along this entire division, but it is located so close to the river bank that it cannot be made a permanent work, and is disregarded in this location and estimate.

It is proposed to build a new levee on the line of the roadway, seeing that there is not space sufficient to put it between the road and the river bank. All material is to be taken from the river side. A berme at least 10 feet wide is to be left at the foot of the levee, and the bank of the river must not be broken for 10 feet from its edge.

Levee, 14 feet wide on top, water side slope 1 on 3, land side slope 1 on 2, height about 5 feet. Material required, 34,800 cubic yards.

FIFTH DIVISION.

The Princeton Levee.

Total length	4,200 feet.
Material required	12,400 cubic yards.
Average height of embankment	6 feet.

This work may be best designated in two subdivisions, as follows:

(*a.*) The levee east of the roadway for 1,500 feet above the Town of Princeton proper.

(*b.*) The levee along the town water-front, 2,700 feet in length.

There is already an embankment following approximately the line of the proposed work, but material is not to be had between it and the river bank with which to raise and strengthen it, nor can material be borrowed in its rear for much of the distance between it and the buildings of the town.

The levee is to be added to and made 6 feet high, 6 to 8 feet wide on top, with slopes of 1 on 2 to 1 on 3, as the engineer in charge may direct. Material required, 16,400 cubic yards, less about 4,000 cubic yards in the present embankment that can be utilized in place.

This material, for the most part, will have to be obtained at points too remote from the levee for scraper work, and hence must be brought in wagons or carts, and deposited as the engineer in charge may direct.

SIXTH DIVISION.

The Hunt and Cole and the Boggs Levee, from Princeton to the line between Boggs and Hubbard.

Total length	13,840 feet.
Amount of material required	37,200 cubic yards.
Average height of embankment	5.5 feet.

In subdivisions as follows:

DIMENSIONS AND QUANTITIES.

Subdivision.	Old or New Levee.	Length—Miles.	Height—Feet.	Crown—Feet.	Slope Out.	Slope In.	Above H. W.—Feet.	Material Required—Cub. Yds.
(*a.*)	Present levee	2,640	3½	3	1 on 3	1 on 2	1 to 3	--------
	Proposed levee	--------	5½	6	1 on 3	1 on 2	4	5,200
(*b.*)	Present levee	4,200	4	4	1 on 3	1 on 2	2 to 2½	--------
	Proposed levee	--------	6	6	1 on 3	1 on 2	4	14,000
(*c.*)	Present levee	3,000	--------	--------	--------	--------	--------	--------
	Proposed levee	--------	5	6	1 on 3	1 on 2	4	10,000
(*d.*)	Present levee	4,000	3½	--------	1 on 2½	1 on 1½	2	--------
	Proposed levee	--------	6	6	1 on 3	1 on 2	4	8,000

DESCRIPTION OF SUBDIVISIONS—WORK, ETC.

Subdivision (*a.*)—The Hunt and Cole levee location is fairly good, but placed too close to the edge of the high land. There is but a small berme, 6 feet wide.

Material for enlarging this levee is to be taken with scrapers from without the present borrow ditch, and deposited on top of and on the side of the present levee.

Subdivision (*b.*)—The Boggs levee, upper part. The location is fairly good, and it may be permanently improved.

Material to be obtained and disposed as in the case of *subdivision* (*a.*)

Subdivision (*c.*)—The Boggs levee, middle part. Location poor; too near the bank. Levee not worth preserving and not continuous.

It is proposed to build a new levee, at least 100 feet from the bank. Material to be taken with scrapers from the water side, leaving a berme at least 10 feet, and the bank unbroken for at least 10 feet in width outside the borrow ditch.

Subdivision (*d.*)—The Boggs levee, lower portion. Location poor; too near the bluff bank, for much of its length.

It is proposed to raise and strengthen this levee. The material must be taken from the river side, without the present borrow ditch, when possible so to do, and, when not so possible, from the land side, over sufficient area so as not to make a decided borrow ditch, leaving an untouched berme of 20 feet.

The material is to be placed, for the most part, on the land side of the levee, and as the engineer in charge may direct.

SEVENTH DIVISION.

The Hubbard, Helphenstine, Packer, and Compton Levees.

Total length	12,800 feet.
Material required	37,800 cubic yards.
Average height of embankment	5.5 feet.

In subdivisions as follows:

SUBDIVISION.	Old or New Levee.	Length—Feet.	Height—Feet.	Crown—Feet.	Slope Out.	Slope In.	Above H. W.—Feet.	Material Required—Cub. Yds.
(a.)	Present levee	1,500						
	Proposed levee	1,500	5	6	1 on 3	1 on 2	4	5,000
(b.)	Present levee	1,000	5	2	1 on 2½	1 on 1½	1	
	Proposed levee		8	6	1 on 3	1 on 2	4	5,000
(c.)	Present levee	1,500						
	Proposed levee	1,500	6	6	1 on 3	1 on 2	4	6,600
(d.)	Present levee	400	3	3	1 on 3	1 on 2	1½	
	Proposed levee		5½	6	1 on 3	1 on 2	4	1,000
(e.)	Present levee	2,900	3	3	1 on 3	1 on 2	1	
	Proposed levee		6	6	1 on 3	1 on 2	4	13,340
(f.)	Present levee	2,800	4	6	1 on 4	1 on 2	3	
	Proposed levee		5	6	1 on 3	1 on 2	4	2,800
(g.)	Present levee	2,700	3	2	1 on 2½	1 on 1½	2	
	Proposed levee		5	6	1 on 3	1 on 2	4	6,000

DESCRIPTION OF SUBDIVISION AND WORK.

Subdivision (*a.*)—A portion of the Hubbard levee. The present alignment must be abandoned, and a new levee built on a line across the bend in the old levee, on the high bank land several hundred feet from the river.

All material for this levee to be taken from the river side. A berme of 20 feet is to be left.

Subdivision (*b.*)—A portion of the Hubbard levee. This, in its present position, may be made permanent.

All material to be taken from the water side. A berme of 15 feet to be left. Soil, firm upland. Material abundant. Route open.

Subdivision (*c.*)—A portion of the Hubbard levee. This, in its present position, cannot be made permanent. Abandon present levee and build a new one further away from the old channel bank—at least 120 feet therefrom.

All material for this work to be taken from the water side, leaving a berme of 20 feet. Soil, firm upland. Route open.

Subdivision (*d.*)—The last 400 feet of the Hubbard levee may be permanently built in its present position.

All material must be taken with scrapers from the water side of the present levee and deposited on or against it, as the engineer in charge may direct, leaving a berme of at least 10 feet. Soil, firm upland. Material scarce. Route open.

Subdivision (*e.*)—The Helphenstine levee. Most of this levee is too near the slough bank, and must be set back for permanent work.

Construct new levee, at least 120 feet from bank, using material in old, and taking all material from water side, leaving a berme of 15 feet.

Subdivision (*f.*)—The Packer levee. Location good. Material abundant on the river side for raising, etc. Leave berme of 15 feet.

Subdivision (*g.*)—The Compton levee. Location fairly good. Material for work to be taken from river side, leaving berme of 15 feet.

EIGHTH DIVISION.

The Upper Hager, the Morrill, and the Hastings Levees, to near the old Seven-mile House.

Total length	2 miles.
Amount of material to be used	49,300 cubic yards.
Average height of embankment	6 feet.

In subdivisions, as follows:

Subdivision (*a.*)—The Upper Hager levee, about 1 mile in length. This, for the most part, is fairly located. There are many small washouts. Crown grade about even with high water of 1880. Material good, on hard pan.

Present levee, 1.5 to 3 feet high; 1 to 2 feet wide on top; slopes, 1 on 1½.

Add to this levee and change location at points as directed. Make a levee averaging 6 feet high; 6 feet crown width; outer slope, 1 on 3; inner slope, 1 on 2; berme at least 10 feet wide. Take all material from river side.

Material required, 24,600 cubic yards.

Subdivision (*b.*)—Mrs. Morrill's levee, about a quarter mile in length. This is an insignificant embankment, located too near the bank of a slough to be made a permanent work.

Abandon it altogether, as may be directed, and construct a new levee on a line at least 120 feet from the bank. Levee to be of same general dimensions and put up in same manner as that described in the foregoing subdivision.

Material required, 6,200 cubic yards.

Subdivision (*c.*)—The Hastings levee, down to a point on the river about opposite the Seven-mile House site, about three quarter mile in length. This is a small embankment located so near the river bank that sufficient material cannot be had outside to raise it. It is not sufficiently large to make it worth while retaining and adding to with material obtained from the surface on the inside. Abandon this levee. Construct a new levee located on a line at least 120 feet from the river. Dimensions and restrictions the same as for preceding two subdivisions.

Material required, 18,500 cubic yards.

NINTH DIVISION.

The Lower Hastings, the Seaver and Chapman Levees.

Total length	2½ miles.
Amount of material to be moved	54,300 cubic yards.
Average height of embankment	6 feet.

In subdivisions as follows:

Subdivision (*a.*)—The lower Hastings levee, about 1¼ miles in length. This levee is now located so near the banks along which it runs that it cannot be made a permanent work. At one point it is near a caving bank, and has to be set back occasionally. The embankment itself is nearly as good as the Chapman and Seaver levees, but it is not nearly so well located. It is necessary to abandon it and construct a new levee on a line averaging 100 feet further away from the bank. This new levee, to be of dimensions and form similar to those for the work in the preceding division, and constructed under similar restrictions.

Material required, 30,800 cubic yards.

Subdivision (*b.*)—The Chapman and Seaver's levees, about 1¼ miles in length. This embankment is located sufficiently far from the banks to be added to and made a permanent work. It is now about 3½ feet high, 2 to 3 feet wide on crown, with slopes of 1 on 1½ and 2, and is from 2 to 2½ feet above high water.

It is to be added to and raised about 2 feet, with material taken from the water side—deposited sometimes on the outside and sometimes on the inside, as may be directed, leaving a berme of at least 10 feet. New levee to be about 6 feet high; crown, 6 feet; outside slope, 1 on 3; inside slope, 1 on 2.

Material required, 23,500 cubic yards.

TENTH DIVISION.

The Hamilton Levee.

Present location line near 2 miles in length.

Proposed location line about 1¼ miles in length.

Located for the most part on bottom land—upper half mile renewed last year, and now only 60 to 100 feet from a rapidly caving bank of the river.

Next three fourths mile, across neck of low land, crossing several sloughs, which have been repeatedly closed and swept open again.

Next 1,000 feet, near a rapidly caving river bank—part of levee caved away. The whole line should here be set back 300 feet, even if the present general location is to be adhered to.

There are many breaks and washes in this levee. Deep sloughs are closed with embankments only 4 feet wide on top, with slopes 1 on 1½, and these banks are liable to break at any time of high water.

Levee generally 3 to 5 feet high, 2 feet crown, slopes 1 on 1 to 2.

Almost the whole line should be abandoned, and a new line located across the neck, throwing upwards of 100 acres into the river bottom lands.

To make a permanent work of this levee along its present line of location will be a difficult thing. It will have to be moved back for a good portion of the way, and even then is liable to be disturbed by caving banks.

The ground is in part heavily covered by underbrush, and the conditions unfavorable. Proposed general dimensions of work, the same as those next preceding. Grubbing and clearing to be done at expense of contractor. No borrow pit permitted on the inside of the levee within 50 feet of its new base. Berme on outside, 20 feet in width.

These precautions are necessary on account of the nature of the soil, which is for the most part a light alluvial, not underlaid by the hard pan stratum that characterizes the firm bank lands.

Material required (on present line), about 27,500 cubic yards.

As an alternative plan, it is proposed to construct a new levee on a line across the neck, on better ground, open and firmer soil, away from all caving banks.

This levee will be about 7 feet high on the average; crown width, 6 feet; outside slope, 1 on 3; inside slope, 1 on 2; berme, 15 feet in width. All material to be taken from a borrow pit on the outside, not exceeding 2.5 feet in depth.

Material required (new line), 50,000 cubic yards.

(Levee will cross several sloughs, for which more than average dimensions of embankment have been allowed.)

ELEVENTH DIVISION.

The Hager, Sabin, and other Levees, from Hamilton to Colusa.

Total length	2.4 miles.
Amount of material	68,300 cubic yards.
Average elevation of embankment	6.5 feet.

In subdivisions as follows:

Subdivision (*a.*)—The middle Hager levee, 3,000 to 3,500 feet in length.

This is a badly located and very small embankment, for the most part so close to the bank that it cannot be made a permanent work.

Present levee 2 feet high, 1 to 2 feet crown, slopes 1 on 1½ and 2, top about even with high water of 1880; about 20 to 40 feet from bank.

It is proposed to disregard this embankment and construct a new levee, on a line about 120 feet from the bank. This levee will be about 6.5 feet high, crown 6 feet, outside slope 1 on 3, inside slope 1 on 2, berme 15 feet. All material to be taken from the outside, as directed.

Material required, 17,400 cubic yards.

Subdivision (*b.*)—The Sabin levee, about 1 mile in length.

This embankment is moderately well located, and can be made a permanent work, except the upper 500 or 600 feet, which will have to be moved back.

It is from 3 to 5 feet high. Was not overtopped or broken by the flood waters of 1880. It is 2 to 3 feet wide on crown, with slopes of 1 on 1½ to 2.

It is proposed to construct a new levee for the first 500 to 600 feet, and thence add to that already existing.

Resulting embankment to be same dimensions, etc., as that in the preceding subdivision.

Material required, 17,700 cubic yards.

Subdivision (*c.*)—The lower Hager levee, about 4,000 feet in length.

Located too near bank of slough. Levee 1½ to 2 feet high. Was overtopped all along by the high water of 1880.

Cannot be made a permanent work. Should be ignored and new levee constructed farther in from bank.

It is proposed to ignore this embankment and construct a new levee on a line about 100 feet farther back from the bank. The new levee to be about the same dimensions as that for the preceding subdivision.

Material required, 21,400 cubic yards.

Subdivision (*d.*)—Levee from the lower Hager levee to the Colusa Town levee, about 2,000 feet in length.

The county road embankment, about 14 feet wide on top, and having an elevation of about 3 feet above ground, at present serves as levee. Its elevation is just about that of high water. The road embankment serves as levee for a distance of about 1,400 feet.

It is proposed to raise this embankment, giving it a height of about 6½ feet, and making its top width 16 feet; side slopes, 1 on 2.

From the point where the levee leaves the county road, a new embankment is to be constructed in a straight line along the road, of the same dimensions as the embankment above, to the line of the present city levee, which must be extended to and connected with the road embankment. Length, 1,000 feet.

All material for the levee construction must be taken from the outside, where there is sufficient width of bank to allow for a 10-foot berme, a pit not over four feet deep, and a marginal strip of land along the river 20 feet wide.

In all other cases material may be taken from the inside, not nearer than 50 feet to the levee base.

Material required, 11,800 cubic yards.

MISCELLANEOUS PROVISIONS.

In the construction of all new work, and the addition to all old work, the surface upon which material is placed is to be first well broken by plowing or otherwise.

In filling all crevasses, washouts, and sloughs, and in joining all new banks to old, the faces of banks to be joined with are to be pulled down clean to a slope at least as flat as 1 on 4, and then thoroughly broken before new material is placed on.

All ground worked over or upon is to be thoroughly cleared of rubbish and grubbed of roots and stumps to a depth of at least 1½ feet.

In the discretion of the engineer in charge, and where, from the nature of the soil it may be advisable, there may be a trench 6 feet wide and 1 to 2 feet in depth, worked over with plows and scrapers under the crown of the levee before the new work is raised; this work to be paid for at the same rate per cubic yard as the embankment over it.

All earthwork, except where otherwise specially provided in these specifications, is to be executed with scrapers, and the runs are to be regulated according to the directions of the engineer in charge.

All earth used in this work except where otherwise specially provided in these specifications, is to be taken from the water side of the proposed embankment when possible to get it without violating the following provisions:

Outside of all levees a berme at least 10 feet in width is to be left between the foot of the levee slope and the top edge of the borrow ditch. When possible the berme is to be 15 to 20 feet in width, as specified or as directed by the engineer in charge.

The immediate bank of the river or channel along which a levee is to be raised or constructed must not be broken or cleared for at least 10 feet in width, and if possible an unbroken margin of 20 to 30 feet should be left, as directed in each instance.

No borrow ditch shall be over 300 feet in length, there being left a ramp of earth in place 30 feet wide at each 300 foot interval; and the borrow ditch is not to be made more than 1 foot extra depth above and below it.

LAYING OUT AND MEASUREMENT OF WORK.

It is to be remembered in locating this work that the present object is to perfect the river bank to an elevation of 4 feet above the flood line of 1880, and that in the future the whole line of embankment probably should be raised from 1 to 3 feet. Hence, all work must be disposed in the matter of position, etc., so that material may be had on the outside with which to make the additions, which themselves should be made on the outside where practicable.

This work is to be staked out by the resident engineer, under direction of the State Engineer, and is to be carried forward to the satisfaction of the engineers and the Board of Directors of the district.

All extra work of any class herein specified, which the contractor may undertake, performed on the same side of the Sacramento River above Colusa, shall be done at contract prices on the measurement thereof.

All earthwork shall be completed to depths of one tenth over true grade line to allow for settlement, and measured only to grade.

Measurements of earthwork added to levees to be made in the pit from which excavated or on the bank upon which placed, as may be most convenient to the engineer in charge, or as the resident engineer may direct.

Work is only to be accepted and approved, and taken off the hands of the contractor upon the final completion in all respects of all to be done in the division of the work in which it is situated.

In case of any undue settling of any part of the work, after the completion of that part, the integrity of the work is to be preserved in such manner as the State Engineer may specify and the Board of Directors direct, and consequent differences between the contractor and the Board of Directors are to be adjusted by the Directors, in their discretion.

SCHEDULE OF WORK.

Divisions.	Length—Miles.	Height—Feet.	Material—Cubic Yards.
First division	7.4	4.5	137,000
Second division	2.0	5.5	33,000
Third division	2.2	5.5	60,000
Fourth division	1.2	5.0	34,800
Fifth division	0.8	6.0	12,400
Sixth division	2.3	5.5	37,200
Seventh division	2.2	5.5	37,800
Eighth division	2.0	6.0	49,300
Ninth division	2.5	6.0	54.300
Tenth division	2.0 1.25	6.0 7.0	27,500 50,000
Eleventh division	2.4	6.5	68,300

BIDS FOR WORK.

The work to be executed under these specifications, is the earthwork hereinbefore described, including all that may be necessary to do in excavating, moving, placing the material as specified, preparing therefor, and completing the levees.

Bids are desired for this work, per cubic yard, measured as aforesaid, in each of the eleven (11) divisions of the work, with an alternative bid for the earthwork in the tenth division, according to the alternative plan of construction.

SET No. 14.

Specifications for a Levee from Colusa to Swamp Land District No. 70.

FIRST DIVISION.

From a point on the present Levee at the cross roads about opposite the lower limit of the Town of Colusa to the bend 3,500 feet above Butte Slough.

Total length	24,200 feet.
Total material required	143,451 cubic yards.
General height of embankment	7 feet.

In subdivisions as follows:

Subdivision (*a.*)—From the point of beginning as above down to the head of the Sullivan levee, at a corner about 1,100 feet above the house of J. P. Sullivan, and 2,000 feet below the house of Jacob Laux. Distance, 15,000 feet.

Along nearly all of this frontage a levee now exists, but it is located so near to the river bank that it cannot be made a permanent work, and, moreover, it does not leave sufficient waterway between it and the opposite embankment.

A new levee is to be constructed on an alignment about 150 feet distant from the river bank, and parallel to the general direction thereof.

This levee is to be 7 feet high, with a top width of 6 feet; outside slope, 1 on 3; inside slope, 1 on 2; berme, 15 feet.

All material is to be taken from the outside or water side of the embankment.

Amount of material required, 91,395 cubic yards.

Subdivision (*b.*)—The (so-called) Sullivan levee, being a levee partially situated on the land of J. P. Sullivan, opposite the lands of Fellows and Perkins, and which is located well back from the river bank. Length, about 4,000 feet.

The present levee is well located, and it is proposed to make it a permanent work, uniform in dimensions with that above as just described.

Amount of material required, 20,372 cubic yards.

Subdivision (*c.*)—From the Sullivan levee to the bend above Butte Slough. Length, about 5,200 feet.

A new levee to be constructed of dimensions equal to that above on a similar alignment, and under similar restrictions.

Amount of material required, 31,684 cubic yards.

SECOND DIVISION.

From the Bend above Butte Slough to the Levee of District No. 70.

Total length	4,230 feet.
Total amount of material required	55,482 cubic yards.
General height of embankment	7.5 feet.
Height of dam in slough	50 feet.

In subdivisions as follows:

Subdivision (*a.*)—From the bend to the turn into Butte Slough. Length, 3,000 feet.

A levee to be constructed of height and dimensions corresponding to that in the preceding division; to be similarly situated with respect to the river bank, and the work to be executed under like restrictions, etc.

Material required, 18,279 cubic yards.

Subdivision (*b.*)—Around the turn to the projected dam across Butte Slough—to be situated about 500 feet from its mouth. Length, 1,000 feet.

A levee 8 feet high, with other dimensions, etc., corresponding to that in the preceding subdivision. To be located as the resident engineer may direct on this point, and constructed under restrictions similar to those provided for the foregoing described work.

Material required, 7,703 cubic yards.

Subdivision (*c.*)—A dam across Butte Slough effecting its complete closure.

To be constructed on grade 1 foot above the crest grade of the levee next above as just specified. Crown width 15 feet, river side slope 1 on 4, land side slope 1 on 3.

Material required, 29,500 cubic yards.

MISCELLANEOUS PROVISIONS.

Laying Out and Measurement of Work.

All under the above headings which is incorporated into the specifications for levee work on the west side of the Sacramento River above Colusa, shall be considered as applicable here with adjustment to change in locality.

SCHEDULE OF WORK.

Divisions.	Length, Feet.	Height, Feet.	Material, Cubic Yards.
First division	24,200	7	143,451
Second division	4,230	7.50 to 50	55,482
Totals	28,430		198,933

Upon this work the clearing of heavy and dense brush and timber growth to the extent of forty acres as a limit, and grubbing of stumps from ground covered with such growth, where it may be necessary, along the line of the levee or borrow ground, is not to be executed as part of the earthwork contract, notwithstanding what may be said elsewhere in these specifications.

This work, to the extent of the above limit (40 acres), if so much be necessary, is to be bid upon separately.

The contractor is to do all light clearing and grubbing, where the growth is not sufficiently dense to warrant its being estimated by the acre as part of the earthwork contract.

Where, in the judgment of the engineer in charge, the growth is *heavy* and *dense*, the contractor will be paid by the acre for the clearing and grubbing, according to measurement thereof, up to a limit of 32 acres in the first division of the work, and 8 acres in the second division.

Hence, there *may be* grubbing work, in addition to the earthwork, as follows:

First division	32 acres.
Second division	8 acres.

BIDS FOR WORK.

This work is classed as (1) *earthwork*, and (2) *clearing and grubbing*.

Earthwork includes all necessary to be done in preparing the ground for and erecting the embankments as aforesaid (exclusive of grubbing dense growth of brush, etc., up to the limit mentioned).

Clearing and grubbing includes the complete clearing of the ground and soil of all brush, rubbish, and roots to the depth of one and one half feet under the levee base, and as deep as may be necessary on the borrow ground.

Bids are desired for this work in each of the two divisions separate:

For earthwork, per cubic yard.

For grubbing, etc., per acre.

TABLES

SHOWING

RIVER OBSERVATIONS AND SURVEYS

OF

1878 and 1879.

STATE ENGINEER DEPARTMENT.

River Observations—Season of 1878–9.

Table No. 1. Sacramento River, *from Suisun Bay to Sacramento City*, Low Water Stage.

LOCATION.	SUMMARIZED TIDAL RECORD.									
	Distance from New York.		Distance from preceding station.		Elevation, low tide, above base.	Elevation, high tide, above base.	Difference between high and low tide	Difference in time between succeeding stations		Rate of propagation of tidal wave, station to station
	In feet.	In miles.	In feet.	In miles.	Feet.	Feet.	Feet.	Hours.	Min.	Miles pr. hr.
Via Steamboat Slough.										
New York Landing	-----	-----	-----	-----	0.00	7.35	7.35	-----	-----	-----
Collinsville	15,650	2.964	15,650	2.964	0.15	7.32	7.17	-----	-----	-----
Toland's	49,500	9.375	33,850	6.411	0.55	7.25	6.70	-----	-----	-----
Emmaton	55,700	10.549	6,200	1.174	0.62	7.24	6.62	-----	-----	-----
Three-Mile Slough	70,000	13.257	14,300	2.708	0.99	7.21	6.42	-----	-----	-----
Rio Vista	88,550	16.771	18,550	3.513	1.01	6.92	5.91	2	04	8.1154
Foot of Grand Island	99,000	18.750	10,450	1.979	1.13	6.92	5.79	-----	-----	-----
Hog's Back	119,000	22.538	20,000	3.788	2.81	7.50	4.69	-----	-----	-----
Walker's	125,600	23.788	6,600	1.250	3.12	7.54	4.42	1	11	5.917+
Bogle's	140,350	26.581	14,750	2.794	3.82	7.64	3.82	1	05	2.586+
Kercheval's	161,700	30.625	21,350	4.044	4.66	7.89	3.23	0	50	4.852+
Courtland	172,700	32.708	11,000	2.082	5.00	7.80	2.80	0	40	3.124+
Richland	193,900	36.723	21,200	4.015	5.20	7.93	2.73	-----	-----	-----
Clarksburg	212,875	40.317	18,975	3.594	5.49	7.89	2.40	-----	-----	-----
Davis' Brickyard	231,850	43.911	18,975	3.594	6.11	7.85	1.74	1	50	6.111+
Halfway	239,575	45.374	7,725	1.463	6.52	7.98	1.46	-----	-----	-----
Milla's	247,300	46,337	7,725	1.463	7.03	8.12	1.09	0	20	8.778+
Haycock Shoals	251,650	47.661	4,350	0.824	7.40	8.45	1.05	-----	-----	-----
Du Bose's	261,900	49.602	10,250	1.941	7.79	8.67	0.88	0	37	4.476+
Sacramento	302,650	57.320	40,750	7.718	9.35	9.55	0.20	1	42	4.540

Via Old River.										
Rio Vista	----	----	----	----	----	----	----	----	----	----
Foot of Grand Island	99,000	18.750	10,450	1.979	1.13	6.92	5.79	----	----	----
Isleton	116,250	22.017	17,250	3.267	----	----	----	----	----	----
Walnut Grove	164,750	31.203	48,500	9.186	3.99	7.58	3.59	----	----	----
Kercheval's	195,500	37.027	30,750	5.824	4.66	7.89	3.23	----	----	----

REMARKS.—A point in the river, opposite New York Landing Slough, is the Initial point of the surveys.
The plane of average lowest low tides at New York Landing is the base of surveys.

TABLE No. 1.—Continued.

LOCATION.	LOW WATER PROFILES.							
	Low Tide.				High Tide.			
	Difference in elevation of low tide, station to station	Fall or slope per 1,000.	Fall or slope per mile.		Difference in elevation of high tide, station to station	Fall or slope per 1,000.	Fall or slope per mile.	
	Feet.		In feet.	In inches.	Feet.		In feet.	In inches.
Via Steamboat Slough.								
New York Landing								
Collinsville	0.15	0.0096	0.0506	0.607	—0.03	—0.002	—0.0106	—0.127
Toland's	0.40	0.0118	0.0623	0.747	—0.07	—0.002	—0.0106	—0.127
Emmaton	0.07	0.0118	0.0623	0.747	—0.01	—0.002	—0.0106	—0.127
Three-Mile Slough	0.17	0.0118	0.0623	0.747	—0.03	—0.002	—0.0106	—0.127
Rio Vista	0.22	0.0118	0.0623	0.747	—0.29	—0.0156	—0.0825	—0.990
Foot of Grand Island	0.12	0.0118	0.0623	0.747	0.00	0.000	0.0000	0.000
Hog's Back	1.68	0.084	0.4435	5.322	+0.58	+0.029	+0.1531	+1.837
Walker's	0.31	0.0475	0.2505	3.006	+0.04	+0.0066	+0.0346	+0.415
Bogle's	0.70	0.0475	0.2505	3.006	+0.10	+0.0066	+0.0346	+0.415
Kercheval's	0.84	0.0393	0.2077	2.493	+0.25	+0.0115	+0.0606	+0,727
Courtland	0.34	0.0309	0.1632	1.958	—0.09	—0.0082	—0.0432	—0.518
Richland	0.20	0.0094	0.0498	0.598	+0.13	+0,0062	+0.0324	+0.389
Clarksburg	0.29	0.0153	0.0807	0.968	—0.04	—0.0021	—0.0111	—0.134
Davis' Brickyard	0.62	0.0327	0.1725	2.070	—0.04	+0.0021	—0.0111	—0.134
Halfway	0.41	0.0531	0.2802	3.363	+0.13	+0.0175	+0.0922	+1.107
Milla's	0.51	0.0660	0.3486	4.183	+0.14	+0.0175	+0.0922	+1.107
Haycock Shoals	0.37	0.0851	0.4491	5.389	+0.33	+0.0759	+0.4005	+4.806
Du Bose's	0.39	0.0383	0.2021	2.426	+0.22	+0.0216	+0.1139	+1.367
Sacramento	1.56	0.0383	0.2021	2.426	+0.88	+0.0216	+0.1139	+1.367

Via Old River.								
Rio Vista								
Foot of Grand Island	0.12	0.0118	0.0623	0.747	0.00	0.000	0.00	0.00
Isleton								
Walnut Grove	2.86	0.0435	0.2297	2.756	+0.66	+0.010038	+0.0530	+0.636
Kercheval's	0.67	0.0218	0.1150	1.380	+0.31	+0.0101	+0.0532	+0.639

STATE ENGINEER DEPARTMENT.

River Observations—Season of 1878–79.

Table No. 2. Sacramento River, *from Suisun Bay to Sacramento City*, Flood Stage.

SUMMARIZED TIDAL AND ROD RECORDS.

LOCATION.	Distance from New York.		Distance from preceding station.		Elevation of low tide above base.	Elevation of high tide above base.	Difference between high and low tide.
	In feet.	In miles.	In feet.	In miles.			
Via Steamboat Slough.							
New York Landing	----------	----------	----------	----------	1.30	7.50	6.20
Collinsville	15,650	2.964	15,650	2.964	2.58	7.86	5.28
Toland's	49,500	9.375	33,850	6.411	5.36	8.64	3.28
Emmaton	55,700	10.549	6,200	1.174	5.70	8.79	3.09
Three-mile Slough	70,000	13.257	14,300	2.708	6.50	8.82	2.32
Rio Vista	88,550	16.771	18,550	3.513	8.57	9.77	1.20
Foot of Grand Island	99,000	18.750	10,450	1.979	9.42	10.28	0.86
Hog's Back	119,000	22.538	20,000	3.788	11.50	11.50	0.00
Walker's	125,600	23.788	6,600	1.250	Tide has no effect.	11.59	Tide has no effect.
Bogle's	140,350	26.581	14,750	2.794		12.69	
Kercheval's	161,700	30.625	21,350	4.044		16.15	
Courtland	172,700	32.708	11,000	2.082		16.32	
Richland	193,900	36.723	21,200	4.015		17.97	
Clarksburg	212,875	40.317	18,975	3.594		19.58	
Davis' Brickyard	231,850	43.911	18,975	3.594		20.61	
Half-way	239,575	45.374	7,725	1.463		21.30	
Milla's	247,300	46.337	7,725	1.463		21.86	
Haycock Shoals	251,650	47.661	4,350	0.824		22.47	
Du Bose	261,900	49.602	10,250	1.941		23.50	
Sacramento	302,650	57.320	40,750	7.718		27.27	
Via Old River—Rio Vista.							
Foot of Grand Island	99,000	18.750	10,450	1.979	9.42	10.28	0.86
Isleton	116,250	22.017	17,250	3.267	----------	10.68	----------
Walnut Grove	164,750	31.203	48,500	9.186	----------	13.62	----------
Kercheval's	195,500	37.027	30,750	5.824	----------	16.15	----------

Remarks.—A point in the river, opposite New York Landing Slough, is the Initial point of the surveys.
The plane of average lowest low tides at New York Landing is the base of surveys.

Table No. 2—Continued.

LOCATION.	HIGH WATER PROFILE.							
	Low Tide.				High Tide, or High Water.			
	Difference in elevation of low tide, station to station.	Fall or slope per 1,000.	Fall or slope per mile.		Difference in elevation of high tide, station to station.	Fall or slope per 1,000.	Fall or slope per mile.	
	Feet.	--------	In feet.	In inches.	Feet.	--------	In feet.	In inches.
Via Steamboat Slough—New York Landing.								
Collinsville	1.28	0.0821	0.4335	5.202	0.36	0.0230	0.1216	1.459
Toland's	2.78	0.0821	0.4335	5.202	0.78	0.0230	0.1216	1.459
Emmaton	0.34	0.0556	0.2936	3.523	0.15	0.0242	0.1277	1.533
Three-mile Slough	0.80	0.0556	0.2936	3.523	0.03	0.0021	0.0111	0.133
Rio Vista	2.07	0.1116	0.5892	7.070	0.95	0.0512	0.2704	3.245
Foot of Grand Island	0.85	0.0813	0.4295	5.154	0.51	0.0488	0.2577	3.092
Hog's Back	2.08	0.1040	0.5491	6.589	1.22	0.0610	0.3221	3.865
Walker's					0.09	0.0136	0.0720	0.864
Bogle's					1.10	0.0746	0.3938	4.725
Kercheval's					3.46	0.1621	0.8557	10.268
Courtland					0.17	0.0155	0.0816	0.979
Richland					1.65	0.0778	0.4109	4.931
Clarksburg					1.61	0.0848	0.4480	5.376
Davis' Brickyard					1.03	0.0543	0.2866	3.439
Half-way					0.69	0.0893	0.4716	5.659
Milla's					0.56	0.0725	0.3828	4.593
Haycock Shoals					0.61	0.1402	0.7404	8.885
Du Bose					1.03	0.1005	0.5306	6.367
Sacramento					3.77	0.0925	0.4885	5.862
Via Old River—Rio Vista.								
Foot of Grand Island								
Isleton					0.40	0.0232	0.1224	1.469
Walnut Grove					2.94	0.0606	0.3201	3.841
Kercheval's					2.53	0.0823	0.4344	5,213

STATE ENGINEER DEPARTMENT.

River Observations—Season of 1878-79.*

Table No. 3. Sacramento River, *from Sacramento City to Colby's Ferry*, Low Water and Flood Stages.

LOCATION.	SUMMARY OF ROD RECORDS.						
	Distance from New York.		Distance from preceding station.		Elevation, low water, above base—feet	Elevation, high water, above base—feet	Difference bet. high and low water—feet
	In feet.	In miles.	In feet.	In miles.			
Du Bose.							
Sacramento	302,650	57.320	40,750	7.718	9.35	27.27	17.92
Mouth of American River	308,000	58.333	5,350	1.013	9.83	28.00	18.17
Bryte's Bend	322,000	60.985	14,000	2.652	10.92	28.82	17.90
Six-mile Bar, upper end	332,600	62.992	10,600	2.007	11.80	29.72	17.92
Monument	345,200	65.379	12,600	2.386	12.25	30.50	18.25
Ten-mile Shoals, lower end	348,400	65.985	3,200	0.606	12.44	30.62	18.18
Ten-mile Shoals, upper end	359,740	68.133	11,340	2.148	13.62	30.75	17.13
Elkhorn Ranch	366,300	69.375	6,560	1.242	13.84	30.83	16.99
Jacobs' Break, upper end	378,000	71.591	11,700	2.216	14.34	31.09	16.75
Gray's and Shaw's, u. g.	389,700	73.807	11,700	2.216	14.77	31.82	17.05
Brown's Break, u. g.	400,000	75.758	10,300	1.951	15.14	32.87	17.73
Gibson's	405,830	76.862	5,830	1.104	15.53	33.39	17.86
Mouth of Feather River	412,250	78.078	6,420	1.216	16.03	33.81	17.78
Gray's Bend	452,500	85.701	40,250	7.623	17.78	35.12	17.34
Portuguese Bend	478,500	90.625	26,000	4.924	19.36	35.76	16.40
Portuguese Bend, at point	480,000	90.909	1,500	0.284	19.65	35.84	16.19
Knight's Landing	488,400	92.500	8,400	1.591	19.97	36.12	16.15
D. C. Reel's	522,400	98.939	34,000	6.439	21.77	38.40	16.63
Rackerby's	542,650	102.774	20,250	3.835	23.17	40.31	17.14
Moore's	550,980	104.352	8,330	1.578	23.72	41.32	17.60
Kirkville	571,250	108.191	20,270	3.839	25.06	43.50	18.44

Winn's Landing	599,500	113.541	28,250	5.350	26.93	45.73	18.80
Wilkins' Slough	641,970	121.585	42,470	8.044	30.26	51.00	20.74
Eddy's	675,730	127.979	33,760	6.394	32.91	54.36	21.45
Sycamore	720,200	136.401	44,470	8.422	37.59	59.49	21.90
Meridian	729,500	138.163	9,300	1.761	38.57	59.80	21.23
Moon's Ferry	749,840	142.015	20,310	3.852	40.71	62.04	21.33
Butte Slough	753,300	142.670	3,460	0.655	40.95	62.96	22.01
Colusa	783,400	148.371	30,100	5.701	43.10	66.80	33.70
Calden's	850,300	161.041	66,900	12.670	57.46	79.42	21.96
Princeton	891,000	168.750	40,700	7.709	66.66	87.71	21.05
Butte City	916,160	173.515	25,160	4.765	----------	92.70	----------
Jacinto	977,600	185.151	61,440	11.636	----------	111.72	----------
Mouth of Stony Creek	1,032,000	195.454	54,400	10.303	----------	130.51	----------
Chico Ferry	1,054,000	199.621	22,000	4.167	----------	138.10	----------
Colby's Ferry	1,106,800	209.621	52,800	10.000	----------	156.16	----------
Tehama	1,233,500	233.620	126,720	24.000	----------	218.20	----------
Red Bluff	1,313,700	248.621	80,200	15.000	244.10	266.80	22.70
Iron Cañon, g. s.	1,340,700	253.735	27,000	5.114	----------	282.50	----------

* Low water, Fall of 1878. High water, Spring of 1879.

Remarks.—A point in the river, opposite New York Landing Slough, is the Initial point of surveys.
The plane of average lowest low tides at New York Landing is the base of surveys.

Table No. 3—Continued.

LOCATION.	HIGH AND LOW WATER PROFILES.							
	Low Water.				High Water.			
	Difference in elevation of low water, station to station—feet	Fall, or slope, per thousand	Fall, or slope, per mile.		Difference in elevation of high water, station to station—feet	Fall, or slope, per thousand	Fall, or slope, per mile.	
			In feet.	In inches.			In feet.	In inches.
Du Bose.								
Sacramento								
Mouth of American River	0.48	0.0897	0.4737	5.685	0.73	0.1364	0.7204	8.645
Bryte's Bend	1.09	0.0779	0.4111	4.933	0.82	0.0586	0.3093	3.712
Six-mile Bar, upper end	0.88	0.0830	0.4383	5.260	0.90	0.0849	0.4483	5.380
Monument	0.45	0.0357	0.1886	2.263	0.78	0.0619	0.3269	3.922
Ten-mile Shoals, lower end	0.19	0.0594	0.3135	3.762	0.12	0.0375	0.1980	2.376
Ten-mile Shoals, upper end	1.18	0.1041	0.5494	6.593	0.13	0.0115	0.0605	0.726
Elkhorn Ranch	0.22	0.0335	0.1772	2.126	0.08	0.0122	0.0644	0.773
Jacobs' Break, upper end	0.50	0.0427	0.2256	2.708	0.26	0.0222	0.1173	1.408
Gray's and Shaw's, u. g.	0.43	0.0368	0.1940	2.329	0.73	0.0624	0.3294	3.953
Brown's Break, u. g.	0.37	0.0359	0.1897	2.276	1.05	0.1019	0.5382	6.459
Gibson's	0.39	0.0669	0.3532	4.238	0.52	0.0892	0.4711	5.653
Mouth of Feather River	0.50	0.0779	0.4112	4.935	0.42	0.0654	0.3453	4.144
Gray's Bend	1.75	0.0435	0.2296	2.755	1.31	0.0325	0.1718	2.062
Portuguese Bend	1.58	0.0608	0.3209	3.850	0.64	0.0246	0.1300	1.560
Portuguese Bend, at point	0.29	0.1933	1.0208	12.250	0.08	0.0533	0.2816	3.379
Knight's Landing	0.32	0.0381	0.2011	2.413	0.28	0.0333	0.1760	2.112
D. C. Reel's	1.80	0.0529	0.2795	3.354	2.28	0.0671	0.3541	4.249
Rackerby's	1.40	0.0691	0.3650	4.380	1,91	0.0943	0.4930	5.976
Moore's	0.55	0.0660	0.3486	4.183	1.01	0.1212	0.6402	7.682
Kirkville	1.34	0.0661	0.3490	4.188	2.18	0.1075	0.5679	6.814
Winn's Landing	1.87	0,0662	0.3495	4.194	2,23	0.0789	0.4168	5.002

Wilkin's Slough	3.33	0.0784	0.4140	4.968	5.27	0.1240	0.6552	7.862
Eddy's	2.65	0.0785	0.4145	4.973	3.36	0.0995	0.5255	6.306
Sycamore	4.68	0.1052	0.5557	6.668	5.13	0.1153	0.6091	7.309
Meridian	0.98	0.1054	0.5564	6.676	0.31	0.0333	0.1760	2.111
Moon's Ferry	2.14	0.1052	0.5555	6.666	2.24	0.1101	0.5815	6.978
Butte Slough	0.24	0.0694	0.3662	4.394	0.92	0.2659	1.4049	16.859
Colusa	2.15	0.0714	0.3771	4.526	3.84	0.1276	0.6736	8.083
Calden's	14.36	0.2146	1.1333	13.600	12.62	0.1887	0.9960	11.952
Princeton	9.20	0.2260	1.1935	14.322	8.29	0.2037	1.0755	12.906
Butte City					4.99	0.1983	1.0472	12.566
Jacinto					19.02	0.3096	1.6345	19.614
Mouth of Stony Creek					18.79	0.3454	1.8237	21.885
Chico Ferry					7.59	0.3450	1.8216	21.859
Colby's Ferry					18.06	0.3420	1.8060	21.672
Tehama					62.04	0.4896	2.5850	31.020
Red Bluff					48.60	0.6059	3.2400	38.880
Iron Cañon, g. s.					15.70	0.5815	3.0700	36,840

STATE ENGINEER DEPARTMENT.

River Observations—Season of 1878–1879.*

Table No. 4. Feather River, *from the mouth of Feather River to Oroville,* Low Water and Flood Stages.

LOCATION.	SUMMARY OF ROD RECORDS.						
	Distance from New Landing.		Distance from preceding station.		Elevation, low water, above base—feet	Elevation, high water, above base—feet	Difference bet. high and low water—feet
	In feet.	In miles.	In feet.	In miles.			
Mouth of Feather River	412,250	78.078			16.03	33.81	17.78
Cross Section, 20	421,590	79.847	9,340	1.769	19.29	34.68	15.39
Cross Section, 22	435,275	82.438	13,685	2.592	23.41	35.95	13.65
D. O. Mahoney's	442,250	83.759	6,975	1.321	24.24	36.60	13.19
Cross Section, 25	452,460	85.693	10,210	1.934	25.74	38.76	14.52
Nicholaus	466,800	88.409	14,340	2.716	26.48	41.80	16.06
Mouth of Bear River	474,100	89.792	7,300	1.383	28.93	43.93	17.45
Cross Section, 29	489,375	92.685	15,275	2.893	30.02	48.37	19.44
Cross Section, 30	498,775	94.465	9,400	1.780	36.11	49.76	19.74
Cross Section, 32	524,300	99.299	25,525	4.834	38.90	53.04	16.93
Cross Section, 33, about 600 feet below O'Neil	533,000	100.947	8,700	1.648	40.85	54.52	15.62
Cross Section, 34	545,800	103.371	12,800	2.424	44.66	59.01	18.16
Spanger's	557,000	105.492	11,200	2.121	47.38	63.00	18.34
Cross Section, 35	564,975	107.003	7,975	1.510	49.48	64.40	17.02
Mouth of Yuba River	571,250	108.191	6,275	1.188	49.79	67.16	17.68
California Pacific Railroad Bridge	573,025	108.527	1,775	0.336	49.83	67.90	18.11
S. M. Bliss'	579,000	109.659	5,975	1.132	49.99	69.80	19.97
Cross Section, 48	601,740	113.966	22,740	4.307	50.79	72.33	22.34
Channel Station, 1235	617,500	116.951	15,760	2.985	51.44	75.81	25.02
Channel Station, 1248	624,000	118.182	6,500	1.231	52.65	77.25	25.81
Channel Station, 1259	629,500	119.223	5,500	1.042	57.50	78.46	25.81
Channel Station, 1280	640,000	121.212	10,500	1,989	59.16	80.78	23.28

Channel Station, 1290	645,000	122.159	5,000	0.947	66.15	82.38	23.22
Channel Station, 1320	660,000	125.000	15,000	2.841	77.56	87.19	21.04
Channel Station, 1368	684,000	129.545	24,000	4.545	84.74	98.00	20.44
Burt's Ferry	699,000	132.386	15,000	2.841	----------	105.94	21.20
Channel Station, 1443	721,500	136.648	22,500	4.261	----------	122.10	----------
Channel Station, 1480	740,000	140.152	18,500	3.504	----------	136.80	----------
Lava Beds	746,500	141.383	6,500	1.231	----------	140.90	----------
Oroville	764,500	144.792	18,000	3.409	----------	158.30	----------
Oroville gauge	767,000	145.265	2,500	0.473	----------	162.80	----------

* Low water of 1878. High water of 1879.

REMARKS.—A point in the river, opposite New York Landing Slough, is the Initial point of surveys.
The plane of average lowest low tides at New York Landing is the base of surveys.

Table No. 4—Continued.

LOCATION.	HIGH AND LOW WATER PROFILES.							
	Low Water.				High Water.			
	Difference in elevation of low water, station to station—feet	Fall, or slope, per thousand	Fall, or slope, per mile.		Difference in elevation of high water, station to station—feet	Fall, or slope, per thousand	Fall, or slope, per mile.	
			In feet.	In inches.			In feet.	In inches.
Mouth of Feather River								
Cross Section, 20	3.26	0.3490	1.8429	22.115	0.87	0.0930	0.4910	5.892
Cross Section, 22	3.01	0.2199	1.1613	13.936	1.27	0.0930	0.4910	5.892
D. O. Mahoney's	1.11	0.1591	0.8403	10.083	0.65	0.0930	0.4910	5.892
Cross Section, 25	0.83	0.0813	0.4292	5.151	2.16	0.2118	1.1184	13.420
Nicholaus	1.50	0.1046	0.5523	6.628	3.04	0.2118	1.1184	13.420
Mouth of Bear River	0.74	0.1014	0.5352	6.423	2.13	0.2911	1.5372	18.447
Cross Section, 29	2.45	0.1604	0.8469	10.162	4.44	0.2911	1.5372	18.447
Cross Section, 30	1.09	0.1160	0.6123	7.347	1.39	0.1470	0.7808	9.369
Cross Section, 32	6.09	0.2386	1.2598	15.117	3.28	0.1286	0.6790	8.149
Cross Section, 33, about 600 feet below O'Neil	2.79	0.3207	1.6932	20.319	1.48	0.1701	0.8982	10.778
Cross Section, 34	1.95	0.1523	0.8044	9.652	4.49	0.3508	1.8521	22.225
Spanger's	3.81	0.3405	1.7981	21.577	3.99	0.3564	1.8816	22.579
Cross Section, 35	2.72	0.3405	1.7981	21.577	1.40	0.1755	0.9269	11.123
Mouth of Yuba River	2.10	0.3347	1.7670	21.204	2.76	0.4398	2.3224	27.868
California Pacific Railroad Bridge	0.31	0.1746	0.9221	11.066	0.74	0.4169	2.2012	26.415
S. M. Bliss'	0.04	0.0070	0.0368	0.441	1.90	0.3180	1.6789	20.146
Cross Section, 48	0.16	0.0070	0.0368	0.441	2.53	0.1113	0.5874	7.049
Channel Station, 1235	0.80	0.0508	0.2680	3.216	3.48	0.2209	1.1661	13.994
Channel Station, 1248	0.60	0.1000	0.5280	6.336	1.44	0.2209	1.1661	13.994
Channel Station, 1259	1.21	0.2200	1.1616	13.939	1.21	0.2209	1.1661	13.994
Channel Station, 1280	4.85	0.4619	2.4385	29.263	2.32	0.2209	1.1661	13.994
Channel Station, 1290	1.66	0.3320	1.7530	21.036	1.60	0.3205	1.6922	20.307

Channel Station, 1320	6.99	0.4664	2.4624	29.549	4.81	0.3205	1.6922	20.307
Channel Station, 1368	11.41	0.4754	2.5102	30.1224	10.81	0.4504	2.3782	28.538
Burt's Ferry	7.18	0.4787	2.5278	30.334	7.94	0.5293	2.7949	33.539
Channel Station, 1443	--------	--------	--------	--------	16.16	0.7182	3.7922	45.507
Channel Station, 1480	--------	--------	--------	--------	14.7	0.7946	4.1955	50.345
Lava Beds	--------	--------	--------	--------	4.1	0.6308	3.3305	39.966
Oroville	--------	--------	--------	--------	17.4	0.9667	5.1040	61.248
Oroville gauge	--------	--------	--------	--------	4.5	1.8000	9.504	114.048

STATE ENGINEER DEPARTMENT.

River Observations—Season of 1878–79.*

Table No. 5. Yuba River, *from the mouth to the Smartsville Dumps,* Low Water and Flood Stages.

LOCATION.	SUMMARY OF ROD RECORDS.						
	Distance from New York.		Distance from preceding station.		Elevation, low water, above base—feet	Elevation, high water, above base—feet	Difference bet. high and low water—feet
	In feet.	In miles.	In feet.	In miles.			
Mouth of Yuba River	571,250	108.191	----	----	49.48	67.16	17.68
Channel Station, 114+550	572,550	108.437	1,300	0.216	52.09	67.16	15.07
Wagon Bridge	575,600	109.015	3,050	0.578	55.07	67.16	12.09
Channel Station, 1168	584,000	110.606	8,400	1.591	63.77	68.80	5.03
Channel Station, 1182+200	591,200	111.970	7,200	1.364	71.27	74.4	3.13
Channel Station, 1214+100	607,100	114.981	15,900	3.011	88.29	91.30	3.01
Channel Station, 1225+400	612,900	116.079	5,800	1.098	95.25	97.7	2.45
Channel Station, 1235+100	617,600	116.970	4,700	0.890	103.71	105.6	1.89
Channel Station, 1248+100	624,100	118.201	6,500	1.231	113.16	116.5	3.34
Channel Station, 1266	633,000	119.886	8,900	1.686	126.11	130.0	3.89
Channel Station, 1283+200	641,700	121.534	8,700	1.648	----	145.8	----
Channel Station, 1294+400	647,400	122.614	5,700	1.080	----	163.9	----
Yuba Mill and Mining Company	654,200	123.902	6,800	1.288	----	190.4	----
Channel Station, 1322+200	661,200	125.227	7,000	1.325	----	217.7	----
Station 960 of line No. 3	664,800	125.909	3,600	0.682	----	237.0	----
One and a quarter miles above Smartsville dumps	684,974	129.730	20,174	3.821	----	313.0	----

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* Low water of 1878; high water of 1879.

TABLE No. 5—Continued.

LOCATION.	HIGH AND LOW WATER PROFILES.							
	LOW WATER.				HIGH WATER.			
	Difference in elevation of low water, station to station—feet	Fall, or slope, per thousand	Fall, or slope, per mile.		Difference in elevation of high water, station to station—feet	Fall, or slope, per thousand	Fall, or slope, per mile.	
			In feet.	In inches.			In feet.	In inches.
Mouth of Yuba River	----	----	----	----	----	----	----	----
Channel Station, 1145+50	2.61	2.0077	10.6006	127.207	0.00	----	----	----
Wagon Bridge	2.98	0.9770	5.1588	61.906	0.00	----	----	----
Channel Station, 1168	8.70	1.0357	5.4686	65.623	1.64	0.1952	1.0309	12.370
Channel Station, 1182+200	7.50	1.0417	5.5000	66.000	5.6	0.7778	4.1067	49.280
Channel Station, 1214+100	17.02	1.0704	5.6519	67.823	16.9	1.0629	5.6121	67.345
Channel Station, 1225+400	6.96	1.2000	6.3360	76.032	6.4	1.1034	5.8262	69.914
Channel Station, 1235+100	8.46	1.8000	9.5040	114.048	7.9	1.6809	8.8753	106.504
Channel Station, 1248+100	9.45	1.4545	7.6800	92.160	10.9	1.6769	8.8542	106.250
Channel Station, 1266	12.95	1.4545	7.6800	92.160	13.5	1.5169	8.0090	96.108
Channel Station, 1283+200	----	----	----	----	15.8	1.8161	9.5890	115.068
Channel Station, 1294+400	----	----	----	----	18.1	3.1754	16.7663	201.196
Yuba Mill and Mining Company	----	----	----	----	26.5	3.8985	20.5843	247.012
Channel Station, 1322+200	----	----	----	----	27.3	3.8985	20.5843	247.012
Station 960 of line No. 3	----	----	----	----	19.3	5.3611	28.3067	339.680
One and a quarter miles above Smartsville dumps	----	----	----	----	76.0	3.7672	19.8909	238.691

REMARKS.—A point in the river, opposite New York Landing Slough, is the Initial point of surveys.
The plane of average lowest low tides at New York Landing is the base of surveys.

TABLE No. 5—Continued.

Main Yuba, from Station 1095 of Line No. 3, opposite Smartsville Dumps, up to South Yuba, and up South Yuba to Omega Mine.

LOCATION.	SUMMARY OF ROD RECORDS.				Elevation, low water, above base—feet	Elevation, high water, above base—feet	Difference bet. high and low water—feet
	Distance from Smartsville mining dumps; also, mouth of Pittsburg Tunnel.		Distance from preceding station.				
	In feet.	In miles.	In feet.	In miles.			
One thousand feet above Blue Point sluice, 3167 feet above commencement of line, opposite Smartsville dumps, opposite mouth of Pittsburg Tunnel—Compass Station 4	3,167	0.59	----------	----------	289.4	----------	----------
One mile and a quarter above dumps—Compass Station 8	6,674	1.26	3,507	0.66	302.	313.	11.0
About one mile above Deer Creek—Compass Station 19	14,597	2.76	7,923	1.50	332.	344.	12.0
Compass Station 27	20,968	3.97	6,371	1.20	358.5	370.7	12.2
Compass Station 35	27,283	5.17	6,315	1.20	386.0	401.0	15.0
Compass Station 51	38,491	7.29	11,088	2.13	435.5	455.	19.5
Mouth of South Yuba—Compass Station 65	48,367	9.16	9,876	1.87	484.5	496.	11.5
South Yuba—Compass Station 84	58,319	11.04	9,952	1.88	622.0	635.	13.00
Half mile below little Shady Creek—Compass Station 108	71,417	13.54	13,098	2.48	871.0	884.	13.00
Seven hundred feet below Shady Creek—Compass Station 121	79,352	15.03	7,735	1.47	999.8	1,011.8	12.00
Half mile below Purdew's Bridge—Compass Station 173	110,896	21.00	31,544	5.97	1,633.4	1,646.0	12.60
Edward's Bridge—Compass Station 198	134,698	25.51	23,802	4.51	1,954.7	1,964.4	9.7
North Bloomfield dumps—Compass Station 222	156,374	29.62	21,676	4.11	2,187.4	2,201.4	14.0
Compass Station 237	168,875	31.98	12,501	2.37	2,268.	2,283.	15.0
Compass Station 254	185,802	35.19	16,927	3.21	2,401.4	2,414.	12.6
Compass Station 273	197,895	37.48	12,093	2.29	2,508.4	2,522.	12.6
About one mile distant from Washington, below Omega dumps—Comp. Sta. 289	208,405	39.47	10,510	1.99	2,627.	2,640.	13.0
Omega mining dumps—Compass Station 294	212,177	40.18	3,772	0.71	2,666.	----------	----------

NOTE.—Station 0 of this line is equal to Station 1095 (reduced) of Line No. 3, north side of Yuba.

Table No. 5—Continued.

LOCATION.	HIGH AND LOW WATER PROFILES.							
	Low Water.				High Water.			
	Difference in elevation of low water, station to station—feet	Fall or slope per thousand	Fall or slope per mile.		Difference in elevation of high water, station to station	Fall or slope per thousand	Fall or slope per mile.	
			In feet.	In inches.			In feet.	In inches.
One thousand feet above Blue Point sluice, 3167 feet above commencement of line, opposite Smartsville dumps, opposite mouth of Pittsburg Tunnel—Compass Station 4								
One mile and a quarter above dumps—Compass Station 8	12.6	3.59	19.00	229.8				
About one mile above Deer Creek—Compass Station 19	30.0	3.78	20.00	240.00	31.0	3.91	20.70	248.40
Compass Station 27	26.5	4.15	22.10	265.20	26.7	4.19	22.20	266.40
Compass Station 35	27.5	4.36	22.91	274.92	30.0	4.79	25.25	303.00
Compass Station 51	49.5	4.46	23.24	277.88	54.0	4.87	25.35	304.20
Mouth of South Yuba—Compass Station 65	49.0	4.96	26.20	314.40	41.0	4.15	21.92	263.04
South Yuba—Compass Station 84	137.5	13.81	73.13	877.56	139.0	13.96	73.93	887.16
Half mile below Little Shady Creek—Compass Station 108	249.0	19.02	100.40	1,204.80	249.0	19.02	100.40	1,204.80
Seven hundred feet below Shady Creek—Compass Station 121	128.8	16.65	87.62	1,051.44	127.8	16.52	87.00	1,044.00
Half mile below Purdew's Bridge—Compass Station 173	633.6	20.09	106.13	1,273.56	634.2	20.10	106.21	1,274.52
Edward's Bridge—Compass Station 198	321.3	13.49	71.24	854.88	318.4	13.35	70.60	847.20
North Bloomfield dumps—Compass Station 222	232.7	10.73	56.62	679.44	237.0	10.93	57.66	691.92
Compass Station 237	80.6	6.45	34.01	408.12	81.6	6.53	34.43	413.16
Compass Station 254	133.4	7.85	41.56	498.72	131.0	7.70	40.50	486.00
Compass Station 273	107.0	8.84	46.72	560.04	108.0	8.93	47.16	445.92
About one mile distant from Washington, below Omega dumps—Compass Station 289	118.6	11.30	59.59	715.08	118.0	11.14	59.29	711.48
Omega mining dumps—Compass Station 294	39.0	10.34	56.35	676.20				

Table No. 5—Continued.

*Upper Yuba from Junction of Main Yuba and South Yuba up to Middle Yuba; thence up to bridge between Moore's Flat and Alleghany City.**

LOCATION.	SUMMARY OF ROD RECORDS.				Elevation, low water, above base—feet	Elevation, high water, above base—feet	Difference bet. high and low water—feet
	Distance from junction of Main and South Yuba.		Distance from preceding station.				
	In feet.	In miles.	In feet.	In miles.			
Main and Middle Yuba.							
Junction of South and Main Yuba					484.5	496.	11.5
Mouth of Middle and Main Yuba	42,499	8.05	42,499	8.05	1,203.9	1,228.	24.1
Freeman's Bridge, Middle Yuba	64,591	12.23	22,092	4.18	1,527.	1,540.	13.0
Emory's Old Crossing—remains of old bridge	79,552	15.06	14,961	2.83	1,698.	1,710.	12.0
Grizzly Creek—Compass Station 96	95,020	17.99	15,468	2.93	1,879.	1,893.	14.0
Opposite upper end of Grizzly Ridge—Compass Station, 74	111,333	21.09	16,313	3.19	2,156.	2,167.	13.0
Half mile below Kanaka Creek—Compass Station, 58	126,230	23.91	14,897	2.82	2,276.	2,288.	12.0
Quarter mile above Bloody Run—Compass Station, 42	137,049	26.13	11,719	2.21	2,454.	2,468.	14.0
Foot bridge between Alleghany City and Moore's Flat—Comp. Sta. 50	166,941	31.62	28,992	5.49	2,883.	2,894.	11.0

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* This line commences at mouth of South Yuba.

TABLE No. 5—Continued.

LOCATION.	HIGH AND LOW WATER PROFILES.							
	LOW WATER.				HIGH WATER.			
	Difference in elevation of low water, station to station—feet	Fall or slope per thousand	Fall or slope per mile.		Difference in elevation of high water, station to station	Fall or slope per thousand	Fall or slope per mile.	
			In feet.	In inches.			In feet.	ninches.
Main and Middle Yuba.								
Junction of South and Main Yuba								
Mouth of Middle and Main Yuba	719.4	16.9	89.37	1,072.4	732.0	17.22	90.81	1,089.7
Freeman's Bridge, Middle Yuba	323.1	14.62	77.29	927.48	312.0	14.12	74.64	895.68
Emory's Old Crossing—remains of old bridge	171.0	11.04	60.4	724.8	170.0	11.3	60.05	720.6
Grizzly Creek—Compass Station 96	181.0	11.7	61.8	741.6	183.0	11.8	62.5	750.0
Opposite upper end of Grizzly Ridge—Compass Station 74	277.0	16.98	86.52	1,038.24	274.0	16.79	85.58	1,026.96
Half mile below Kanaka Creek—Compass Station 58	120.0	8.05	42.5	510.00	121.0	8.12	42.9	514.80
Quarter mile above Bloody Run—Compass Station 42	178.0	15.19	80.5	966.00	180.0	15.36	81.4	976.80
Foot bridge between Alleghany City and Moore's Flat—Comp. Sta. 50	429.0	14.79	78.1	937.20	426.0	14.69	77.6	931.20

River Observations—Season of 1878–79.*

Table No. 6. San Joaquin River, *from New York Landing to Stanislaus River*, Low Water and Flood Stage.

LOCATION.	SUMMARY OF ROD RECORDS.						
	Distance from Initial Point.		Distance from Preceding Station.		Elevation, low water, above base—feet	Elevation, high water, above base—feet	Difference bet. high and low water—feet
	In feet.	In miles.	In feet.	In miles.			
New York Landing	5,750	1.080	----	----	0.00	8.00	8.00
Webb's Landing	114,600	21.705	108,850	20.616	0.83	8.15	7.32
Mouth of Old River	123,750	23.438	9,150	1.733	0.87	8.16	7.29
Harrington's Landing	164,650	31.184	40,900	7.746	1.05	8.22	7.17
Black Slough	219,500	41.572	54,850	10.388	2.09	8.45	6.36
Twelve-mile Slough	229,800	43.523	10,300	1.951	2.29	8.71	6.42
Wakefield	241,700	45.777	11,900	2.254	2.52	10.06	7.54
Stockton Channel	262,400	49.697	20,700	3.920	3.20	12.28	9.08
Brownell's	295,300	55.928	32,900	6.231	4.28	15.81	11.53
Head of Old River	336,500	63.731	41,200	7.803	5.64	20.24	14.60
San Joaquin Bridge	350,100	66.307	13,600	2.576	6.09	21.70	15.61
Paradise Cut	368,150	69.725	18,050	3.419	8.99	23.33	14.34
Williams' Landing	372,500	70.549	4,350	0.824	----	23.72	----
Via Old San Joaquin River.							
Mouth of Old River	123,750	23.438	----	----	0.87	8.16	7.29
Holman's Slough	182,750	34.612	59,000	11.174	1.53	7.88	6.35
Union Island Landing	233,800	44.280	51,050	9.668	2.10	8.90	6.80
River Station 554+120	277,120	52.485	43,320	8.205	2.58	9.77	7.19
Mohr's Landing	317,500	60.133	40,380	7.648	3.03	11.64	8.61
M. Lammer's	335,750	63.589	18,250	3.456	3.23	12.49	9.26
River Station 693+400	346,900	65.701	11,150	2.112	3.36	13.87	10.51
Mouth of Salmon Slough	372,000	70.455	25,100	4.754	----	16.46	----
Middle River	387,040	73.303	15,040	2.848	----	----	----
Head of Old River	409,100	77.481	22,060	4.178	----	----	----

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* Low water of 1878; high water of February, 1878.

TABLE No. 6—Continued.

San Joaquin River, from New York Landing to Stanislaus River.

LOCATION.	HIGH AND LOW WATER PROFILES.							
	LOW WATER—1878.				HIGH WATER—1878.			
	Difference in elevation of low water, station to station--feet.	Fall, or slope, per thousand-----	Fall, or slope, per mile.		Difference in elevation of high water, station to station--feet.	Fall, or slope, per thousand-----	Fall, or slope, per mile.	
			In feet.	In inches.			In feet.	In inches.
Webb's Landing	0.83	0.0076	0.0403	0.483	0.15	0.0014	0.0074	0.088
Mouth of Old River	0.04	0.0044	0.0232	0.278	0.01	0.0014	0.0074	0.088
Harrington's Landing	0.18	0.0044	0.0232	0.278	0.06	0.0015	0.0077	0.093
Black Slough	1.04	0.0191	0.1007	1.209	0.23	0.0042	0.0221	0.266
Twelve-mile Slough	0.20	0.0191	0.1007	1.209	0.26	0.0252	0.1333	1.599
Wakefield	0.23	0.0191	0.1007	1.209	1.35	0.1134	0.5990	7.188
Stockton Channel	0.68	0.0329	0.1739	2.087	2.22	0.1074	0.5670	6.804
Brownell's	1.08	0.0329	0.1739	2.087	3.53	0.1074	0.5670	6.804
Head of Old River	1.36	0.0329	0.1739	2.087	4.43	0.1074	0.5670	6.804
San Joaquin Bridge	0.45	0.0329	0.1739	2.087	1.46	0.1074	0.5670	6.804
Paradise Cut	2.90	0.1607	0.8483	10.180	1.63	0.0902	0.4761	5.714
Williams' Landing					0.39	0.0902	0.4761	5.714
Via Old San Joaquin River.								
Holman's Slough	0.66	0.0112	0.0589	0.707	—0.28	—0.0047	—0.0251	—0.301
Union Island Landing	0.57	0.0112	0.0589	0.707	+1.02	+0.0200	+0.1057	+1.269
River Station 554+120	0.48	0.0112	0.0589	0.707	0.87	0.0200	0.1057	1.269
Mohr's Landing	0.45	0.0112	0.0589	0.707	1.87	0.0464	0.2450	5.567
M. Lammer's	0.20	0.0112	0.0589	0.707	0.85	0.0464	0.2450	5.567
River Station 693+400	0.13	0.0112	0.0589	0.707	1.38	0.1239	0.6542	7.850
Mouth of Salmon Slough					2.59	0.1032	0.5448	6.538

NOTES.—Zero of distance is a point in center of Sacramento River, on a line running from New York Landing Slough to extreme point on *south bank* of Spoonbill Creek. Zero of elevations, base, or plane of reference is the mean of the lowest low tides during low water period at New York Landing.

SURVEYS OF 1878 AND 1879.

TABLE No. 7. SACRAMENTO RIVER—*Relative elevation of Low Water; Flood, Natural Bank and Levee planes.*

LOCALITY. (General.)	RIGHT BANK. Locality. (Specific.)	Average elevation above L.W. 1878 Bank	Levee	H. W. 1878	H. W. 1879	LEFT BANK. Locality. (Specific.)	Av'ge elevat'n above L. W. 1878. Bank	Levee	H. W. 1878	H. W. 1879
Main River.										
Collinsville	Collinsville.					Collinsville.				
	Below Toland's ¾ of a mile	4.6	9.7		8.1	Below Toland's 2½ miles				
to 1	Rio Vista	6.5		10.0	8.5	Emmaton	5.2	9.6	8.6	8.1
	Foot of Grand Island	7.6		11.6	8.8	Three-Mile Slough	5.5	11.4	8.6	8.0
						Rio Vista	6.5	11.0	10.2	8.6
Foot of Grand Island						Foot of Grand Island	9.0	12.0	11.5	8.9
Steamboat Slough Ch'l										
Foot Grand Island	Foot of Grand Island.					Foot of Grand Island.				
	Sutter Slough	6.5		12.6	8.7	Lower end Grand Island levee	5.0		13.0	9.0
to 2	Head of Grand Island	9.4		13.4	10.0	Walker's Landing	5.0	13.5	13.5	9.0
						Sutter Slough	6.7	14.5	13.4	8.7
Head Grand Island.						Head of Grand Island	9.2	15.1	13.6	10.1
Old River Channel.										
Foot Grand Island	Foot of Grand Island.					Foot of Grand Island.				
	Lower end Grand Island levee	7.5		11.4	8.8	Isleton	7.2	12.5	11.1	8.5
to 3	Hebb's house	6.9	14.1	10.6	8.2	Walnut Grove	8.0	11.9	11.0	8.5
	Walnut Grove	8.2	13.1	11.1	8.7	Head of Grand Island	10.0	13.7	11.8	10.2
Head Grand Island	Head of Grand Island	10.0	15.0	11.7	10.1					

Main River Channel. Head Grand Island to Clarksburg.	4	Head of Grand Island.					Head of Grand Island.				
		Sutter Slough	11.5	--------	13.9	10.3	Courtland	10.0	14.5	13.8	11.4
		Clarksburg	11.7	15.4	14.1	12.5	Clarksburg	11.2	15.5	14.1	12.5
Clarksburg to Du Bose.	5	Clarksburg.					Clarksburg.				
		Millas	13.4	18.0	15.2	14.2	Davis' Brickyard	13.0	15.7	14.8	14.0
		Du Bose	13.9	18.2	16.3	15.7	Du Bose	13.7	17.5	15.7	14.8
Du Bose to Sacramento.	6	Du Bose.					Du Bose.				
		Break at Lendale's	14.1	18.2	18.0	16.1	Break at Lendale's	14.4	18.4	18.0	16.0
		Sacramento	14.3	20.0	19.8	17.5	Old bed of American River	14.0	21.4	20.0	17.5
Sacramento to Monument.	7	Sacramento.					Old bed of American River.				
		Bryte's Bend	14.7	22.1	20.4	17.9	Bryte's Bend	15.5	--------	20.5	18.0
		Monument	14.5	20.5	19.6	17.9	Monument	15.3	--------	19.5	17.8
Monument to Hayes' Landing.	8	Monument.					Monument.				
		Hayes' Landing	14.5	18.1	18.0	16.8	Jacobs' Break	15.5	--------	18.2	16.9
							Hayes' Landing	14.3	18.0	17.6	16.6
Hayes' Landing to Feather River.	9	Hayes' Landing.					Hayes' Landing.				
		Break above Gray and Shaw's	15.8	18.7	17.8	16.8	Brown's	14.1	18.6	17.6	16.7
		Brown's	16.8	--------	18.1	17.3	Feather River	14.5	18.9	18.7	17.9
		Feather River	15.8	19.2	18.6	17.6					
Feather River to Gray's Bend.	10	Feather River.					Feather River.				
		Gray's Bend	15.8	20.2	18.7	17.6	Gray's Bend	15.5	--------	18.7	17.6
Gray's Bend to Knight's Landing.	11	Gray's Bend.					Gray's Bend.				
		Break at Johnson's	15.5	19.3	17.9	16.6	Rackerby's	15.7	--------	17.7	16.6
		Knight's Landing	16.2	--------	17.9	16.2	Knight's Landing	17.0	--------	18.0	16.2
Knight's Landing to Moore's.	12	Knight's Landing.					Knight's Landing.				
		Bostwick	15.7	20.2	18.8	16.6	Two miles below Bostwick's	16.0	--------	19.1	16.4
		Moore's	16.6	20.0	17.4	17.1	Moore's	16.0	17.5	17.5	17.0
Moore's to Winn's Landing.	13	Moore's.					Moore's.				
		Two miles below Winn's Ld'g	17.1	--------	17.8	18.3					
		Winn's Landing	16.8	19.6	18.1	18.6	Winn's Landing	16.8	18.8	17.9	18.4
Winn's Land'g to Wilkin's Sl'gh	14	Winn's Landing.					Winn's Landing.				
		Wilkins' Slough	18.5	22.0	19.5	20.0	Wilkin's Slough	18.8	21.0	19.5	20.0

TABLE No. 7—Continued.

LOCALITY. (General.)		RIGHT BANK.					LEFT BANK.				
		Locality. (Specific.)	Average elevation above L. W. 1878.				Locality. (Specific.)	Av'ge elevat'n above L. W. 1878.			
			Bank	Levee	H. W. 1878	H. W. 1879		Bank	Levee	H. W. 1878	H. W. 1879
Wilkins' Sl'gh to Grimes' Land'g	15	Wilkins' Slough. Grimes' Landing	19.1	22.5	20.5	21.1	Wilkins' Slough. Grimes' Landing	18.9	21.6	20.6	21.2
Grimes Landing to Meridan.	16	Grimes' Landing. Meridian	20.0	22.8	21.2	21.3	Grimes' Landing. Grand Island Mills	19.3	--------	20.9	21.3
							Meridian	20.0	22.0	21.9	21.5
Meridan to Colusa.	17	Meridian. Butte Slough	20.5	23.5	22.0	21.2	Meridian. Butte Slough	20.1	23.0	22.0	21.2
							Two miles above Butte Slough	20.8	--------	22.5	21.8
		Colusa	21.5	24.4	22.6	22.2	Colusa	21.8	23.3	22.8	22.7
Colusa to Calden's.	18	Colusa. Above Colusa 3½ miles	22.0	25.0	23.0	23.6	Colusa. Chapman's	21.8	--------	22.7	23.2
		Below Calden's 3 miles	21.3	--------	22.3	22.6	Calden's	19.8	--------	21.8	22.3
		Calden's	20.9	23.8	21.6	22.1					
Calden's to Princeton.	19	Calden's. Princeton	20.1	23.5	20.5	21.5	Calden's. Princeton	19.9	--------	20.5	21.5
Princeton to Butte City.	20	Princeton. Butte City	20.0	22.5	20.2	20.6	Princeton. Butte City	20.0	--------	20.2	20.6

This table is a synopsis of a careful study of the elevations of high water, low water, banks, and levees of the Sacramento River, in which the average heights of banks and levees between the designated points have been computed, from a number of points on the profiles.

STATE ENGINEER DEPARTMENT.

SURVEYS OF 1878 AND 1879.

TABLE NO. 8.

SACRAMENTO RIVER—*Levee, Bank, and Flood Elevations.*

RIGHT BANK.

			Height of existing levee	Elevation of existing levee above water, 1878	Additional height	Total height of proposed levee above high water, 1878	Total height of proposed levee above bank
Main River. Collinsville to Foot of Grand Island.	1	Collinsville.					
		¾ of a mile below Tolands	5.1	----	----	3.0	----
		Rio Vista	----	----	----	----	----
		Foot of Grand Island	----	----	----	----	----
		----	----	----	----	----	----
Steamboat Slough Channel. Foot of Grand Island to Head of Grand Island.	2	Foot of Grand Island.	----	----	----	----	----
		Sutter Slough.	----	----	----	----	----
		Head of Grand Island	----	----	----	----	----
Old River Channel. Foot of Grand Island to Head of Grand Island	3	Foot of Grand Island	----	----	----	3.0	----
		Lower end Grand Island levee	----	----	----	----	----
		Hebbs' House	7.2	3.5	—0.42	3,08	6.78
		Walnut Grove	4.9	2.0	1.16	3.16	6.06
		Head of Grand Island	5.0	3.3	—0.06	3.24	4.94
Main River Channel. Head of Grand Island to Clarksburg	4	Head of Grand Island.					
		Sutter Slough	----	----	----	----	----
		Clarksburg	3.7	1.3	1.98	3.28	5.68
Clarksburg. to Du Bose	5	Clarksburg.					
		Millas	4.6	2.8	0.56	3.36	5.16
		Du Bose	4.3	1.9	1.50	3.40	5.80

LEFT BANK.

			Height of existing levee	Elevation of existing levee above high water, 1878	Additional height	Total height of proposed levee above high water, 1878	Total height of proposed levee above bank
Main River. Collinsville to Foot of Grand Island.	1	Collinsville.					
		2½ miles below Tolands	----	----	----	----	----
		Emmaton	4.4	1.0	----	----	----
		Three-Mile Slough	5.9	2.8	----	----	----
		Rio Vista	4.5	0.8	----	----	----
		Foot of Grand Island	3.0	0.5	2.50	3.0	5.50
Steamboat Slough Channel. Foot of Grand Island to Head of Grand Island.	2	Foot of Grand Island.					
		Lower end of Gr'd Island Levee	----	----	----	----	----
		Walker's Landing	8.8	0.3	2.70	3.10	11.50
		Sutter Slough	7.8	1.1	----	----	----
		Head of Grand Island	5.9	1.5	1.74	3.24	7.64
Old River Channel. Foot of Grand Island to Head of Grand Island	3	Foot of Grand Island					
		Isleton	5.3	1.4	1.65	3.05	6.95
		Walnut Grove	3.9	0.9	2.26	3.16	6.16
		Head of Grand Island	3.7	1.9	1.34	3.24	5.04
Main River Channel. Head of Grand Island to Clarksburg	4	Head of Grand Island.					
		Courtland	4.5	0.7	2.54	3.24	7.04
		Clarksburg	4.3	1.4	1.84	3.24	6.14
Clarksburg. to Du Bose	5	Clarksburg.					
		Davis' Brickyard	2.7	0.9	2.46	3.36	5.16
		Du Bose	3.8	1.8	1.60	3.40	5.40

TABLE No. 8—Continued.

			Height of existing levee	Elevation of existing levee above high water, 1878	Additional height	Total height of proposed levee above high water, 1878	Total height of proposed levee above bank		Height of existing levee	Elevation of existing levee above high water, 1878	Additional height	Total height of proposed levee above high water, 1878	Total height of proposed levee above bank
Du Bose to Sacramento	6	Du Bose.						Du Bose.					
		Break at Lendale's	4.1	0.2				Break at Lendale's	4.0	0.4			
		Sacramento	5.7	0.2	3.30	3.50	9.00	Old bed of American River	7.4	1.4	2.10	3.50	9.50
Sacramento to Monument.	7	Sacramento.						Old bed of American River.					
		Bryte's Bend	7.4	1.7	2.85	3.55	9.25	Bryte's Bend				3.55	
		Monument	6.0	0.9	2.70	3.60	8.70	Monument				3.60	
Monument to Hayes' Landing.	8	Monument.						Monument.					
		Hayes' Landing	3.6	0.1	3.59	3.69	7.19	Jacobs' Break					
								Hayes' Landing	3.7	0.4	3.29	3.69	6.99
Hayes' Landing to Feather River.	9	Hayes' Landing.											
		Break above Gray & Shaw's	2.9	0.9	2.81	3.71	5.71	Hayes' Landing.					
		Brown's						Brown's	4.5	1.0	2.74	3.74	7.24
		Feather River	3.4	0.6	3.10	3.76	6.50	Feather River	4.4	0.2	3.56	3.76	7.96
Feather River to Gray's Bend.	10	Feather River.						Feather River.					
		Gray's Bend	4.4	1.5	2.36	3.86	6.76	Gray's Bend					
Gray's Bend to Knight's Landing.	11	Gray's Bend.						Gray's Bend.					
		Break at Johnson's	3.8	1.4	2.51	3.91	6.31	Rackerby's					
		Knight's Landing.						Knight's Landing					
Knight's Landing to Moore's.	12	Knight's Landing.						Knight's Landing.					
		Bostwick	4.5	1.4	2.63	4.03	7.13	Two miles below Bostwick's					
		Moore's	3.4	2.6	1.49	4.09	4.89	Moore's	1.5	0.0	4.09	4.09	5.59
Moore's to Winn's Landing.	13	Moore's.						Moore's.					
		2 miles below Winn's Landing						Winn's Landing	2.0	0.9	3.32	4.22	5.32
		Winn s Landing	2.8	2.5	2.72	4.22	5.52						
Winn's Landing to Wilkins Slough.	14	Winn's Landing.						Winn's Landing.					
		Wilkins Slough	3.5	2.5	1.82	4.32	5.32	Wilkins Slough	2.2	1.5	2.82	4.32	5.02

Wilkins Slough to Grimes' Landing.	15	Wilkins Slough.						Wilkins Slough.					
		Grimes' Landing	3.4	2.0	2.41	4.41	5.81	Grimes' Landing	2.7	1.0	3.41	4.41	6.11
Grimes' Landing to Meridian.	16	Grimes' Landing.						Grimes' Landing.					
		Meridian	2.8	1.6	2.92	4.52	5.72	Grand Island Mills					
								Meridian	2.0	0.1	4.42	4.52	6.42
Meridian to Colusa.	17	Meridian.						Meridian.					
		Butte Slough	3.0	1.5	3.10	4.60	6.10	Butte Slough	2.9	1.0	3.60	4.60	6.50
		Colusa	2.9	1.8	2.85	4.65	5.75	Two miles above Butte Slough					
								Colusa	1.5	0.5	4.15	4.65	5.65
Colusa to Caldens.	18	Colusa.						Colusa.					
		3½ miles above Colusa	3.0	2.0	2.69	4.69	5.69	Chapman's					
		3 miles below Caldens						Caldens					
		Caldens	2.9	2.2	2.62	4.82	5.52						
Caldens to Princeton.	19	Caldens.						Caldens.					
		Princeton	3.4	3.0	1.92	4.92	5.32	Princeton					
Princeton to Butte City.	20	Princeton.						Princeton.					
		Butte City	2.5	2.3	2.68	4.98	5.18	Butte City					

This table has been computed from Table No. 1, showing the relative elevation of low water, flood, natural banks and levee lines on the Sacramento River.
The proposed levees are three feet at the foot, and six feet at the head of the district, above high water of 1878, the intermediate height being proportional to the distances.
This is only a preliminary study, and it has been found that the levees will have to be higher, as shown in a subsequent table.

FOLD OUT

OUT

REPORT

OF THE

STATE ENGINEER

TO THE

Legislature of the State of California--Session of 1881.

Part IV.

IRRIGATION.

SACRAMENTO:
STATE OFFICE : : : J. D. YOUNG, SUPT. STATE PRINTING.
1880.

REPORT.

THE IRRIGATION QUESTION.

To the Legislature of the State of California:

The subject of irrigation presented one of the two great questions delegated to the State Engineer for investigation at the commencement of his labors, in May, 1878, and I had the honor of reporting upon it at considerable length, in a paper submitted to the Legislature, in January, 1880, wherein is contained a description of a large part of the field of irrigation in California, and a discussion of the subject generally. As explained in Part I of the present report, very much additional engineering data and valuable knowledge of the practice and possibilities of irrigation in California, have been acquired since the report in January was made; but seeing that the new work was commenced only six months ago—in July, 1880—under the appropriation for this fiscal year, it has not been possible to complete and present the results in detail to you at this time. The general conclusions, however, which I take it is the important part of the outcome for your consideration as a body, I propose to give in this paper, and to embody the partial engineering results in appendices to be attached at a later date.

This question of irrigation involves many problems—some purely engineering, and others of a legal nature. Those of the first class, are, as a general thing, simple enough: The construction of reservoirs to store water, when in the winter and spring time of year it runs to waste, for use at other times when the supply is inadequate to the necessities of irrigation; the building of dams and canals to divert the waters from the streams out upon the plains for use in irrigation, in each of the great number of cases wherein such works might be undertaken in California, afford problems in engineering not formidable in themselves, neither because of any intricacy of scientific treatment required, nor on account of the extent and costliness of any particular work. But the provision of a system for organization under which these works can be undertaken, the framing of a code whereunder rights may be distributed and maintained without conflict, the establishment of a basis to go upon in the practical solution of each problem as it comes up—a basis of credit upon which money may be secured to do the work—is the problem to be solved first of all, and this is not a purely engineering problem, but one for the wisdom of the Legislature to deal with from the standpoint of the financier, the jurist, the statesman, acting with a knowledge of the law, the physical facts, and the necessities and possibilities in the field at large.

This is a problem, the solution of which could only be undertaken after an examination of the field, in order that there might be an appreciation of the practical points to be met. I have endeavored to make such an examination, and to study this subject in all of its bearings, in order that I might be able to present for your consideration, a definite plan of legislation, to serve as a basis for your labors connected with it. Of course this study has involved an overlooking of the legal aspects of the case, and while I have endeavored to be placed on the right path in this regard, have consulted and conversed with those whose experience has given them an exceptionally extended insight into the legal bearings of the points involved, and have studied the subject myself to the best of my ability, I wish at the outset, in presenting the result, to disclaim any pretension to a depth of treatment from the standpoint of the jurist, desiring especially not to appear in any role other than that of the Engineer who has followed his subject as far as he was able, though the path has led without the legitimate domain of engineering science.

Primarily, I desire to announce this conclusion as one which I find is concurred in by those who have considered the subject in all of its bearings: There is an irrepressible conflict, under the laws of our State, between various interests which have grown up under them, and which are affected by the diversion of water from the streams for irrigation. I speak of this conflict as *irrepressible*, because it cannot be avoided unless some property rights are to be ignored. Hence, the legal questions arising are not to be solved by simple statutory enactment. Rights acquired from the beginning are not to be swept away by the passage of a law or the repeal of any existing statute or part of a code. But the State can administer a system so as to keep down many conflicts which would otherwise arise. The Courts can interpret the laws so as to admit as far as possible of the utilization of waters for irrigation, when the State undertakes to adjust impending conflicts. The whole problem can be simplified by the intervention of State regulation of the use of water. And, whereas the progress of agricultural enterprise is now sadly hampered by the existence of strife over water rights, and the uncertainty as to the result, in the southern part of the State, by a proper policy, the State, while acting in the interest of the people at large, can do away with this conflict, and thus avoid the necessity of infringing upon or generally condemning private rights.

THE CONFLICTING INTERESTS.

As it is, conflicts of interest, for whose adjustment the present laws afford no adequate method, without inflicting grave injury upon one or the other, keep matters connected with water rights for irrigation in such an unsettled condition, that there is no basis of credit upon which to raise money for the construction of irrigation works, and no certainty in farming with irrigation, except in cases where practically all rights can be monopolized or brought under one control, and these instances are few.

Two general classes of conflicts have made themselves known throughout the counties where irrigation is now practiced, namely:

(1) Conflicts between rival appropriators of water, or claimants by prescription; and,

(2). Conflicts between appropriators, or claimants by prescription, and riparian owners.

Of course there are an infinite number of sub-varieties of cases which come up under each of the general classes.

In the San Joaquin Valley, not only are these conflicting interests present, but another element will soon make its appearance (indeed it has already), and we will have, inevitably, unless the State controls and directs the diversion of waters from the San Joaquin River and its tributaries:

(3). The worst conflict of all, namely: that between the appropriators of water for irrigation, and the navigation interests on the main river.

Conflicts of the first class are the most common of occurrence, and were the first to attract attention. There are sometimes from twenty to thirty claimants of water for purposes of diversion from the same stream. The claims have grown up from a variety of sources, and by steps quite gradual and indistinct in their character. In many instances there is no record whatever of the origin of the claim; very few have any record of their progress, except what may be embodied in testimony in the archives of some Court.

In my opinion the solution of the irrigation problem is in the solution of the water right difficulties, and the solution of the water right troubles is only to be accomplished by a government of the streams and waters on the part of the State, just as there is in every other highly civilized country except the United States.

The streams of all European continental countries are in the care of government officers; and no one is permitted to put a permanent structure in the bed bank or channel of a stream, or divert its waters from their channel (except in the case of small temporary appropriations in Spain) without a permit from the proper authorities. No permanent water privilege is to be acquired except after investigation as to whether or not the public interest is to be injured by granting it, and whether other private interests are to be injured or not thereby.

The apportionment of water from the streams to those who have recognized claims—the measuring of it out—is always conducted in old irrigation countries, under the direction of officers competent to measure water as it flows.

In the Eastern States, there has been no necessity thus far for any such control of the streams, and thus Americans do not understand how indispensable it is in a country like California, where over large regions the water creates nearly all the value there is in the land.

I had the honor to call the attention of the Legislature to this point in my former report, in the following language. (See P. IV, p. 7):

> "Thus far, the policy of the State has been to leave the distribution of waters from the streams, to the claimants thereof, and the settlement of disputes between the claimants to the Courts. The General Government might just as well throw open the public domain to appropriation, not have any Land Office, and not require any proof of claims, except when disputed in the Courts by some rival claimant. It must be perfectly apparent that under such a land policy, there would be no basis of credit in lands. The country would be peopled with squatters, and there would be no defined rights, and no protection of those existing; neither would there be any limitation upon extent of appropriation by those who might have the means to obtain large holdings. It is just this policy which the State has pursued towards the irrigation interests—a *free-to-all* rule, which brings trouble to all."

Proposed Settlement of Conflicts.

The question is, how to do away with this clashing of interests.

To settle conflicts between appropriators or claimants by prescription, it has been proposed—and I find the plan advocated by many worthy people, in the irrigation regions—that the State take charge of the whole matter of irrigation—condemn and pay for all existing rights to water, for the public benefit, construct the works of irrigation, and sell the water.

As a variation to this, others advocate an apportionment of the waters, after being condemned for the public good, and paid for by the State, to the lands requiring them.

And again, other people would have all water rights condemned, but paid for by the lands to be benefited in each instance.

I do not think any such plan is feasible, and for the following reasons:

First—The outlay for the satisfaction of existing water claims would necessarily be so great that the State could not be brought to undertake the settlement.

Second—If the State should undertake the construction of irrigation canals, or works of irrigation proper, her enterprise would fail of success, and involve her in enormous expenditures of money.

(See Chapter V, of Part IV, Report of State Engineer, January, 1880.)

Third—If the State should reapportion the waters, the supply would not be sufficient for all, and the conflict would be as great as ever.

Fourth—The conflict between users of water for irrigation and claimants under the riparian principle would still exist, and could not be done away with by condemnation—for the field is immeasurably too great.

Fifth—The conflict between users of water for irrigation and the navigation interests would still exist, and it is altogether impracticable to condemn the right of navigating a public stream.

Riparians vs. Appropriators.

It has been proposed to limit the rights of riparian proprietors to water privileges for the use of stock and domestic purposes. While I heartily concur in this as a correct—in fact, the only admissible—definition of a riparian right in an irrigation country, I see very clearly how the State, by making this simple declaration, and doing no more, will strike a blow at one (the riparian) class of interests, without clearing up the horizon for the other (the appropriation) class, and without doing anything for by far the largest class—those who have dry lands, but no water claim at all.

The appropriators of water have done just what the law permitted them to do. Some few appropriators of water for irrigation have built good works, prepared their lands properly for irrigation, and are really public benefactors—for they have brought health and plenty where formerly ague and poverty, or widespread desolation, reigned. They have, as a class, however, set up extravagant claims to water, have done little to make these claims good, and now hold them to the detriment of the people at large, not being able to organize, and economize the waters themselves, and permitting no one else to do it, because they fear to have adverse claims grow up. I repeat, it is quite natural that this should have been done. In fact, it is the only way by which rights to water could be held at all, and we would all do it if we could. But I doubt the propriety of the State attempting to limit one class of interests—the riparian—which, to say the least, is represented by the majority of people in the State who have any direct interest at all in the matter—for the benefit exclusively of another class—a small minority of her citizens—whom she has already permitted to acquire valuable, or what would then be exceedingly valuable, privileges, by appropriating the waters of her streams, without at the same time taking steps to insure to the class restricted the rights which she does accord them.

The riparian principle carried out upon the English common law rule should not be maintained in California. She never can be a truly great agricultural State without irrigation, and she should set that dog-in-the-manger principle aside, for a system which will insure a respect of all rights as far as can be, and accomplish the greatest good to the greatest number, by the use of the water in irrigation, after satisfying the just demands of riparian proprietors by some means economical of the water supply and at such seasons as will not materially interfere with navigation interests.

The Proposed Remedy.

You will see from this about what I would propose as the solution of the irrigation question, namely: That the State shall direct and control the diversion of waters from the streams; insist upon their economical use; see that riparian proprietors are supplied with water for stock and domestic purposes, at least, if they cannot all come in for a share of the water for irrigation; see that all lands naturally dependent upon a public source of supply get their share, as far as the supply will go, upon some reasonable terms; see that the rights or privileges which have or may in the future accrue, be respected, without necessitating recourse to the Courts in every instance of conflict; and see that sufficient water is left in navigable streams to satisfy the interests of commerce, at stated seasons, when most needed.

This the State can do by virtue of her police authority, and in my humble judgment she will be obliged to do it some day, and the sooner it is done the better for all concerned.

Before, however, she can exercise this authority, she must know definitely what interests she has to deal with—what water rights have accrued, and what is the nature of them—and there must be some general State plan or plans of organization under which irrigation is to be carried on. There can be no satisfactory regulation of rights altogether undefined, and no settled condition of affairs until the irrigation interest is placed on a good business footing by a definition of present rights and an organization for future operations.

Hence, I propose that the State shall:

First—By the passage of a law which might be properly called "An Act to ascertain the extent and nature of valid claims to water for agricultural, mining, and manufacturing purposes:"

1. Institute proceedings to define, for record, the extent and nature of all existing water privileges.
2. Provide for proper State and county records of existing rights to water, and for the annual correction of the same to date.

Second—By the passage of a law, which may with propriety be called "An Act to provide for the control of the streams of the State, and to regulate the diversion of water therefrom:"

(1.) To provide for the care of the streams—the beds, banks, and waters thereof.

(2.) To provide for the issue of water privileges in proportion to the supply of water in each stream, and designate by schedule the extent and order of each claim.

(3.) To provide for supervising the distribution of water from the streams or natural sources of supply, (not strictly private,) to those holding water privileges or rights.

(4.) Establish a definite standard of measure for water used for agricultural and mining purposes.

(5.) To provide for the adjustment of the conflicting interests of the irrigation and the riparian claimants in each instance, as it may come up.

(6.) To provide for the protection of river navigation, by regulating the diversion of water from navigable rivers and their tributaries, so that in some certain periods of time the waters may be used for irrigation, and in some other periods they shall be allowed to flow in the streams for the benefit of commerce.

(7.) Carry on such observations as will detect the locality and cause of waste, or loss of water, in each instance; conduct experiments with the view of discovering the most economical means of distributing and using water in irrigation, without material loss or waste.

(8.) Establish general regulations, from time to time, for the distribution of water in irrigation, which will prevent waste, insure good drainage, and guard against the unhealthful tendency of the careless and vicious use of water in irrigation.

Important Points.

In framing these laws it must be kept in view that the sources of water supply vary in character, and that the nature of rights vary not only with the sources, but in themselves also.

Thus we may have sources of water supply of the following kinds:

- (a) Public streams:
  - The living waters of—
    - Navigable.
    - Tributaries of navigable.
    - Non-navigable.
  - The stored waters of—
    - Stored at private expense.
    - Stored at public expense.
- (b) Private streams:
  - The living waters of—
    - To the extent of private claims.
  - The stored waters of—
    - Stored at private expense.
    - Stored at public expense.
- (c) Natural springs:
  - Having sources above all appropriation.
  - Having sources to be affected by higher appropriation.
- (d) Artificial wells:
  - Artesian wells.
  - Pump wells.
- (e) Waste water from irrigation canals.
- (f) Waste water from irrigated fields.
- (g) Waste water from drainage of moist land.

Claims to water have grown up from:

(a) Simple appropriation and use.
(b) Filing notice, and appropriation under the mining laws.

(c) Filing notices, and appropriations under the Codes.
(d) Appropriations under the Desert land law.
(e) Obtaining privileges from County Water Commissioners.
(f) Through Spanish pueblo privileges.
(g) By ownership of the course, and the natural source of supply.
(h) By ownership of the bed of the stream.
(i) By ownership of the bank of the stream.
(j) By the construction of private wells.
(k) By the storage of waste waters.

What may be Expected.

It is not to be expected that any law or laws can be framed at once which will settle the many conflicts of interest that arise out of these diverse interests and conditions. Without doubt many questions must for all time go to the Courts. But it is certainly possible to put irrigation upon a far better basis than it is now, and at the same time give the Courts some better guide in the execution of their duty than they have now. Certainly, the whole question can be simplified in the manner I propose, and I must confess that after much thought I see no other way how it can be accomplished.

If the matter goes on as it is, it will result, in settling the disputes between rival claimants, in the monopoly of all good water privileges by a few individuals, who will have water to sell under claims acquired without regulation, in the waste of water by reason of works constructed without system and used without proper supervision, and in many instances in the production of unhealthful neighborhoods by unskilled and unrestricted use of water.

And in the settling of disputes between appropriators and riparian proprietors on all streams of short supply, the appropriator will probably go to the wall, and water which might be made, under a proper organization, to irrigate thousands of acres of land, will be allowed to waste in the dry sandy beds of streams and the pools of swamps, to effect some little natural irrigation below, or water a few head of live stock.

The conflict between water appropriation for irrigation and the navigation interest of streams below, cannot be settled but by the intervention of State regulation as indicated.

Effect of the Proposed Plan.

The plan which I have outlined contemplates:

(1.) State regulation of the public sources of supply, the streams, and of waters allotted to claimants from those sources.

(2.) District or private regulation, under general State laws, of the details of distribution from the canals to the irrigators.

(3.) State regulation of the use of water in irrigation—to the end that none be wasted.

(4.) State adjustment of conflicting rights by arbitration, as it were, when possible, or by condemnation where necessary and possible.

When this much has been accomplished there will then be a good basis of credit in irrigation property. Capital can be obtained for the construction of irrigation works, on the credit of a district, whenever it is known that there attaches to the lands thereof, from the State, a good and sufficient water right for their irrigation.

For instance, a district embracing thirty thousand acres of land has a water right. The lands are worth, dry, five dollars per acre. It will cost ten dollars per acre to completely irrigate them. The district says to capital, construct our works according to prearranged State plans and specifications. We, the district, taken as a whole, will pay for this in fifty annual installments, principal and interest, the money to be raised by taxation on the whole property of the district, under the State law, and, at the end of fifty years, take the works off your hands. In the meantime, revenue for the maintenance and administration of the works to be raised from the sale of water to actual irrigators, at prices within limits to be prearranged.

By this plan, good works would be constructed cheaply. The capital becomes a contractor to build works. The State supervises their construction. The interests of the district are protected. Capital has a good security, because there is a good water right attached to the land, and the State is the arbiter between parties to the transaction, by her general law properly administered.

The working of the plan would not be an attack on any class of interests. The appropriators would have their rights definitely determined by a procedure in which they would be called upon to prove up their claims according to the measurements and statistics of the State, made and collected by her Engineer Department. They would not be put to any considerable expense; they would be relieved, in many instances, from future litigation and expense, by having the facts affecting their claims, and all rival claims, made of record, definitely, at once, and there would be no impediment put in the way of continued acquirement of right to the use of water under moderate and wholesome regulations.

Riparian proprietors would be assured their privileges, as far as possible, and would be protected from the effects of the unregulated appropriation which they now fear.

The people of the State would be benefited by an assurance, on the part of the State, that the waters would be used to the best advantage for the greatest number of those requiring them.

PROPOSED MEASURES.

In order that the result of my investigation of this subject might be presented in the plainest and most practical form, and with the view of facilitating your labors, in case you deem proper to accept such result as a correct recommendation, I now present for your consideration the draft of two bills, embodying the ideas which I have just set forth. The first proposed Act is one involving a process before the Courts, and I have therefore called to my aid in its preparation an attorney of eminence, and believe that the result is in proper legal form.

AN ACT

TO ASCERTAIN THE EXTENT AND NATURE OF VALID CLAIMS TO WATER FOR AGRICULTURAL, MINING AND MANUFACTURING PURPOSES.

[Enacting clause.]

Section 1. The Surveyor-General is hereby made ex-officio State Register of water rights, and the Deputy Surveyor-General shall be ex-officio Deputy State Register of water rights. The said State Register shall have the powers and perform the duties hereinafter prescribed, and that may be attached by law to said office.

Sec. 2. The said State Register shall be allowed all actual traveling and other personal expenses necessarily incurred by himself or by his deputy, or clerk, when employed on the business or in the performance of the duties of the office away from the seat of government of the State.

Sec. 3. The said Register must execute an official bond in the the sum of ——— dollars.

Sec. 4. The State Register of Water Rights may employ one clerk for clerical service in and about the business, and in the execution of the duties of his said office.

Sec. 5. The State Engineer shall continue to ascertain, by examinations and surveys in the field, the amount of water used, appropriated or diverted, of and from all natural sources of supply within the State, for agricultural, mining and manufacturing purposes, and the canals, ditches, reservoirs, aqueducts, or other means by which every such use, appropriation or diversion is made or effected; and he shall, from time to time, as the information is acquired, prepare and file in the office of the said State Register, a statement describing and identifying, with as much certainty as may be from said information, the place, extent and works, or means as aforesaid, of such use, appropriation or diversion.

Sec. 6. In order that the origin, extent and nature of all such uses, appropriations, and diversions of the waters within the State, and of all rights, or claims of right thereto may be discovered and recorded, and that the amount of such waters at the disposal and control of the State, be determined:

First—Every person, company, association or corporation heretofore using, appropriating, or diverting, or claiming the right to use, appropriate, or divert, for any or either of the purposes aforesaid, the waters of the lakes, rivers, streams or other natural sources of supply within the State, shall, within one year after this Act takes effect, file in the office of the County Recorder of the county embracing the place where appropriated or diverted, or the place where used, a written declaration stating:

1. The source from which the water has been actually appropriated or diverted, and, if appropriated or diverted under a claim of right, the origin, nature and character of such claim;
2. The place where and the time when the first appropriation or diversion was, in fact, made; its then extent, and its extent thenceforth to and including the time of the filing of said declaration;
3. The kind and dimensions of the works by which the appropriation or diversion has been and is effected; the place where and the specific use or uses to and for which the water has been, and is applied, or employed;

And in the case of a claim of right, without previous actual appropriation or diversion, the said declaration shall state:

(*a*) The origin, nature and character of such claim;

(*b*) The source of supply to which, it is claimed, the right attaches;

(*c*) The quantity of water claimed, and the point of intended diversion;

(*d*) The purposes for which the water is claimed, and the place of intended use;

(*e*) The means by which it is intended to divert the water, and the size of the ditch, canal, flume, pipe, aqueduct or other works by which it is to be diverted;

(*f*) The works, if any, made or constructed, in and by which it is intended to divert the water, the extent thereof, and when the construction ceased.

Said declaration shall be signed by the appropriator or claimant, or, where a corporation is the declarer, by some person thereto duly authorized, and shall be verified by the oath, of the party thereto, to the effect, that said declaration is true to the best of his knowledge, information and belief. Said declaration shall be signed and acknowledged or proved in the manner required by law for the acknowledgment or proof of a grant of real property. The Recorder shall record it in a book kept for that purpose, and, within ten days thereafter, forward a true and correct copy thereof to the said State Register; *provided*, however, that nothing contained in this section shall be construed as applicable to, or as including claims of right to water existing prior to the taking effect of "The Civil Code," and that have ceased, or been forfeited by non-compliance with the provisions of section fourteen hundred and twenty of said Code; and *provided further*, that neither this section, nor anything therein, or in this Act, shall be construed to revive or render valid, to any extent, or for any use or purpose whatever, any claim to water so, as aforesaid, forfeited or extinguished, or any claim to water existing at any time before the passage of this Act, and which, for any cause whatever, has ceased or been forfeited or extinguished by force and effect of any statute, law or rule whatsoever; and, *provided further*, that such declaration is not required for and in respect of a claim to the right of appropriation or diversion founded on riparian ownership where such owner has not actually made an appropriation or diversion under such claim prior to the passage of this Act.

Second—The said State Register is hereby authorized and required to prepare blank forms of declaration for the uses and purposes in this Act mentioned, and shall furnish the several offices of County Recorder therewith. He shall also keep, in a well bound set of books, a complete registration of the statements aforesaid of the State Engineer, and of the declarations aforesaid received at his office from the said County Recorders; and, in like manner, shall keep separate and distinct records of all the findings, judgments or decrees which shall be certified to him by the County Clerks, as hereinafter provided; and shall suitably and conveniently index the said books of record. He shall cause to be instituted the proceedings hereinafter described in the several counties of the State to be commenced in the extreme southern portion thereof and progress northward as rapidly as permitted by the information furnished by the files and records of his office or by the said statements of the State Engineer.

Sec. 7. Upon failure by any claimant (without actual appropriation or diversion as designated in section six of this Act), to make and file the declaration of claim as therein prescribed, such claim and every right therein and thereby set up or asserted shall, by force and effect of the fact of failure itself and alone, cease and thereby become forfeited and extinguished; and upon failure by any claimant who or which has actually diverted water (as designated in said section), to make and file the declaration as therein prescribed for such claimant, all the water so used and appropriated or diverted, by such delinquent claimant shall, from and after the expiration of the said time, be deemed, held, and considered as used, appropriated and diverted for sale, rental or distribution, and subject to the regulation and control of the State, in the manner to be prescribed by law, until such delinquent shall have affirmatively proven, before a Court of competent jurisdiction, and the Court has found and adjudged, that such appropriation is legal and valid and not for any or either of the purposes last aforesaid.

Sec. 8. Within twenty days after the said Register shall have received notice in writing from the State Engineer, that his statement or statements, filed with said Register, as hereinbefore required, constitute a full and complete list of instances of use, appropriation or diversion which said Engineer has found to exist in any County of the State, the said Register shall prepare and deliver to the Attorney-General duplicate certified copies of said statement or statements, with an official request in writing, that the Attorney-General cause proceedings to be taken for judicial inquiry for ascertaining and adjudicating the extent of all or of such of the listed appropriations or diversions as the said Register shall specify, and the origin and nature of the right, or claim of right, if any, under and by authority of which such use, appropriation or diversion was made and is continued or maintained.

Sec. 9. On the receipt by the Attorney-General of the said duplicate certified copies with said accompanying request, he shall forward, to the District Attorney of the county, one of each of said duplicates, with instructions to said District Attorney to institute, in the Superior Court of said county, the special proceedings hereinafter prescribed.

Sec. 10. In every case where any appropriator or claimant is not known, it shall be the duty of the District Attorney to make diligent effort, by all the means of information accessible within the county, for the ascertaining of the name and place of residence of such unknown party.

Sec. 11. The District Attorney, under the supervision and direction of the Attorney-General, shall, in the name of "the people of the State of California," bring and prosecute to judgment, with all practicable speed, an action against the appropriator, in the Superior Court of the county including either the place of diversion or appropriation or the place of use. The complaint, after stating the title of the action, the name of the Court and county, and names of the parties, shall set forth, that the defendant directs and appropriates the certain water from the water source, to the extent and by the means or works as in the said State Engineer's statement are particularly designated, located and described, specifying such particulars concisely and intelligibly, from and according to said statement. The complaint shall then further aver, upon information and belief, that the said appropriated water, or some part thereof, is appropriated without right or authority in law; and pray, that the defendant answer and fully disclose and make known:

First—Whether the said appropriation is the whole or to any part, or to any extent, and for what part or to what extent, is made under a claim of right;

Second—If made under such claim, the origin thereof, and when and how the asserted right accrued;

Third—When was the first appropriation made? its then extent, and the extent of the appropriation thenceforth and to the time of action brought;

Fourth—The size and character of the works for appropriating and diverting the water, and for conducting or diverting the same to the place of use; and the use or uses to which applied during all the time of such appropriation and use; and, further, pray that all the said several matters of fact, as to which discovery is sought, be settled and adjudicated by the findings of the Court, and judgment be entered accordingly; and that in default of appearance and answer by defendant, his said appropriation of water be adjudged a public use and subject to the regulation and control of the State, or, for such other judgment in the premises, as to justice belongs.

Sec. 12. On filing the complaint a summons shall be issued, and service thereof made as provided for other civil cases, by "The Code of Civil Procedure;" but the summons shall recite fully the prayer of the complaint, and shall contain a notice that unless defendant appears and answers, the plaintiff will apply to the Court for judgment that the defendant's appropriation of water is for sale, rental or distribution and a public use, subject to the regulation and control of the State, or for such other judgment as to justice belongs. All the subsequent proceedings in the action, including an appeal to the Supreme Court of the State, shall be subject to and regulated by the provisions of "The Code of Civil Procedure," *save* and *except*, that:

First—No objection shall lie, by demurrer or otherwise, on the ground, that the action is for a discovery under oath;

Second—The answer must be verified, and respond directly and fully to each and every allegation and matter of inquiry in the complaint named. The plaintiffs may, within the same length of of time allowed for answering, reply to the matter set forth in the answer, and if they fail to so reply, such matter shall be taken as true. All new matter set up in the replication shall be deemed denied by the defendants;

Third—No general verdict of a jury shall be allowed, but they shall be required to render special verdicts on questions of fact submitted under the direction of the Court;

Fourth—Findings of fact, whether the trial be with or without a jury, cannot be waived or dispensed with in any case;

Fifth—The judgment or decree of the Court must set forth all the facts, as the Court when the hearing or trial has been by the Court, or as the Court aided by the findings of the jury, when a jury has been empanelled, shall finally find and determine them;

Sixth—If the defendant fails to appear and answer within the time specified in the summons, the plaintiffs may, after the entry of default, elect either to apply for and take judgment of the Court to the effect that the defendant's use or appropriation of the water is a public use and subject to the regulation and control of the State in the manner to be prescribed by law, or, to proceed with their case, and submit to the Court all their evidence and proof, whereupon the Court shall render such judgment as the law of the facts requires and as to justice belongs;

Seventh—If, at the hearing, it shall be satisfactorily shown by the plaintiffs that the defendant has failed to file the declaration required by Section 7 of this Act, the Court, after finding that fact, must further find that the defendant's use or appropriation is for sale, rental or distribution, unless the defendant shall affirmatively prove, by satisfactory evidence, that his use is not for either of said last named purposes;

Eighth—No costs must be allowed to the plaintiff against the defendant except where the Court adjudges or decrees that defendant uses or appropriates the water, or some part thereof, without legal right or authority, or, where the plaintiffs take judgment, on default, to the effect that defendant's use or appropriation is a public use as aforesaid;

Ninth—And, *save* and *except*, also, wherever the provisions of the the said Code of Civil Procedure are unadapted to the special form of action or proceeding authorized by this Act, or inconsistent with the provisions thereof.

Sec. 13. The final judgments or decrees of the Court, rendered in pursuance of this Act, shall be recorded by the County Clerk in a large, and strongly bound book kept for that purpose, and shall be suitably indexed. Within thirty days after such recordation he shall forward a certified copy of the judgment or decree to the State Register of Water Rights, who shall, in like manner, register and index the same.

Sec. 14. The said State Register shall, annually, from the records of his office, make out an abstract of all rights or claims of right to water, in any county, adjudged or decreed, within the year next before, to be valid—showing the locality, extent and means of use, or appropriation, the source of supply and the name or names of the appropriators; and, after first properly registering said abstract, he shall forward a true and correct copy thereof to the County Recorder of the respective county, who shall, in like manner, record such copy in a suitable book kept exclusively for such documents.

SEC. 15. The State Engineer, or an assistant whom he shall depute, shall attend at the hearing or trial of any case wherein his official services or testimony, on behalf of the plaintiff, may be necessary or material.

Memorandum.—If this proposed Act should become law without the adoption of that which follows, also, provision must be made here for the filing of a statement, annually, by each appropriator or diverter of water, setting forth the extent of his appropriation and use for the year past.

SEC. 16. This Act shall shall take effect from and after its passage.

REMARKS ON THE FOREGOING MEASURE.

THE PROPOSED STATE RECORD OF WATER RIGHTS.

Nature of the measure.

The foregoing proposed law, "to ascertion the extent and nature of valid claims to water for agriculture, mining and manufacturing purposes," is a measure which contemplates an amicable or friendly proceedure before the Courts, in the case of each water claim of the character specified, in which the State, as plaintiff, will seek to discover the extent to which each claimant has made good his claim to water, the nature of the foundation upon which he rests it, etc.

Necessity for the measure.

Such a proceeding is made necessary by the existing state of facts, before any final step can be taken which will materially systematize or promote irrigation. The soul, the vital spark, in each and every irrigation enterprise, or property, is its right to water. Privileges to use water have been acquired in California in various ways. Of many such rights no record whatever exists, of others their recognition before the law is found in the archives of the Courts only, and in most of these cases the claim is established but partially, or only as against some particular adverse claimant; even in the case of that class of claims having their origin under the laws which required the filing of a notice of appropriation, there is no knowledge, except in the minds of men, as to the extent to which these claims have been made good, or indeed what claims have been acted upon and appropriations made at all.

Existing water claims undetermined.

No one can go into any county in this State and discover from any record or in any manner whatsoever, the extent in any definite standard of measure, of water rights on any stream where a number of claims exist, or the nature of the foundations for such claims. San Bernardino has obtained by the operation of a special law, which organized a Board of Water Commissioners for that county, about the most complete record of claims; and yet it would be practically valueless to the State in any attempt to determine the extent or number of valid claims, except the attempt be made in the Courts, as contemplated by the measure I have proposed, because (1) dead claims appear on the face of the record in the same terms and with no further notice than those which are alive and valid, (2) the original permits under which valid claims have grown up are many of them indefinite in their expressions of quantity, purpose, and description of works, and (3) no record whatever appears of the actual facts of extent of appropriation and use made under many of the original claims which presumably are valid.

A record of water rights, as well as land titles.

Certainly, it appears to me that the facts concerning water rights should be as easily ascertained by inspection of records as the history of land titles. What condition of society would we have were there no recorded knowledge of the titles to landed property? Would there not be dissension, discord, warfare? Would we not acquire some generally recognized standard of measure for land and a record of titles, or else all property rights be swept away? Yet this is approximately the condition in which the affairs pertaining to water property are in at this time in California. Some generally recognized and definite rights exist that have been built up by force of will, of money, of arms almost, because these were the means that had to be resorted to to maintain the right under our laws; but the great majority of the water claims are as yet unrecognized in the Courts, or but incompletely adjudicated, and indeterminate except by practical observation in the field.

The only remedy possible.

As a remedy for this condition of affairs, I propose that the State shall undertake to ascertain the extent and nature of valid claims to water, and I am advised that the only way to accomplish this is by or through the medium of judicial inquiry. Hence the draft of the Act just submitted.

The title of the Act.

Although this measure is one whose operation is most needed in the agricultural counties where irrigation is practiced, it is necessary to systematize water matters throughout the State, for no law applicable to one particular section of the State only, would be constitutional; and furthermore, if the distribution of water from the streams is to be systematized, as I maintain it must be, by the action of some law closely resembling that of which a draft is presented hereafter, there must be evidently a record of claims existing to water for all purposes from each of the sources of supply. Now, seeing that there are claims to water for mining and manufacturing in irrigation counties, and claims to water for irrigation in mining counties, etc., the measure must necessarily reach to all classes of water claims which exist on the watercourses to be regulated. But the supply of water for cities and towns is not a use which has become so prevalent, or even in existence where it will be absolutely necessary to apply this law should it be enacted, nor so generally indefinite as to require judicial inquiry to be made concerning them, in order to determine their extent. Hence the title of the proposed Act: An Act to ascertain the extent and nature of valid claims to water for agricultural, mining, and manufacturing purposes.

A State record necessary.

If we are to have a proper record of water rights, it is necessary to have a State officer by whom that record shall be kept; and, as it will appear from the next measure proposed, it is doubly necessary to have a State record of rights in order that the State may be in a position to regulate the diversion of water under those rights, and to grant more privileges from time to time, as they can be issued.

Hence, for reasons of economy, and because I believe the State Surveyor-General's office to be the proper State office to hold the record of the State waters, as it does of State lands, I have proposed that the State Surveyor-General shall be ex-officio a State Register of water rights, and shall institute the proceedings necessary to ascertain the extent and nature of valid claims to water from the streams of the State, and keep the record thereof when so determined.

Nature of the operation of the Act.

For the rest, the draft of the measure will be perfectly clear to the mind with legal training—seeing that it is a direction for a proceeding in the Courts.

For reasons which I will not undertake to explain here, but which will be perfectly apparent to those who are familiar with the laws and the Constitution, it has been necessary to frame this measure, so that the proceedings to be conducted under it will be instituted on the supposition that there are really no valid claims to water, but that each claimant must prove his right before it is recognized. The result of such a proceeding would be, once for all, to establish the facts in the history of every water claim, and make them of legal record. Although, to the unreflecting this measure may appear on its face to be an attack on existing water rights, in reality it is not in any particular; for, whereas, water privileges are now for the most part but indefinite and unadjudicated claims, the result of the working of this proposed law will be to make them of record and recognized judicially before the world, as against each other and the State.

Water rights and the supply to water.

It is frequently asserted that all of the available waters in the irrigation regions have been appropriated, and that the volume of supply is the measure of appropriation. This is not so. Valid claims no doubt exist to all of the waters of ordinary flow in some of the irrigation sources of supply, but not in all—even to the extent of the ordinary flow. And furthermore, although the sum of the claims may be equal to or exceed this volume, the measure of the individual rights is undetermined, and the surplus waters of full Winter and Spring flow are not diverted or claimed at all. Rights to the use of flood waters for Winter irrigation and for storage, will be sought for just as soon as the State will determine the extent of existing rights, and be prepared to issue permits in proper form. The proceedings contemplated under the Act proposed, are necessary to ascertain what surplus there exists in the water supply altogether at the disposal of the State. Hence, a record of valid claims, when taken in connection with a statement of the water supply, is a record of the State's surplus waters; and hence there should be a *State record.*

Recordation of claims necessitated.

A leading feature of the measure is that which concerns the recordation of claims; and here the claimants are divided into two classes, (with the fact common to both, that they *antedate* the Act,) viz.: (1) actual appropriators, with or without a claim of right; and (2) claimants of the right to appropriate, without actual appropriation. Both of these classes are called upon to file their declarations, varying in facts to be set forth correspondingly to the category in which they stand. This course will enable the State to get a full and complete record in the Recorder's office of all actual appropriations as claimed to exist, and of all claims to the right of appropriation.

A guarded point.

In this connection it was essential to carefully guard against the reviving or validation of dead, or forfeited claims. These may be set down as being of three classes:

(1.) Those who had forfeited under the operation of Section 1420, Civil Code.

(2.) Those who had initiated claims under the Title VIII, Civil Code, wherein Section 1420 is found, and forfeited under Section 1418, or 1419.

(3.) Those who had initiated or acquired rights under other laws (State or Federal), but have forfeited them by reason of non-compliance with some provisions of the laws themselves, under which the right was initiated, or by legislation independently of such laws, and also by force and effect of mining laws, usages, or customs.

In the absence of the provisos of Section 6, there would be great danger of restoring to life, by means of the proposed recordation of the notice, or declaration, numerous claims which are either absolutely forfeited and extinguished, or that may be judicially declared of "non effect."

The State's authority and right.

The rule proposed to be established which calls upon the appropriators or diverters of water and all claimants of the right to appropriate or divert, to file a statement of their claim, in my judgment, comes clearly within the sanction of Section 1, of Article XIV, of the State Constitution, and the consequence to the claimant, if he fails to comply with the rule, is simply that under this Article the presumption shall be in favor of the State until that presumption is overthrown by the judgment of one of its Courts. If never before, certainly now, by force of the cited provisions of the Constitution, the State may employ such means of segregating (as it were) its own property in water from that of others. And even though the State be not the owner of the residuum, it may yet do so much under its police powers in the interest of the body politic.

No effect on riparian rights.

Another proviso to Section 6 should be noticed. It excepts out of the operation of the recording clauses the riparian claim where such claimant has not appropriated under or in virtue of it; not that the right for that claim is not conceded, but so that the measure will reach appropriators or diverters of water only, or those claiming the right to appropriate and divert for purposes of consuming the supply. Without this exception the duty of recording would be imposed upon thousands of claimants of another class whose claims it is not practicable to define in this manner.

Not an attack on any rights.

I have before remarked that the measure should not be regarded as, in reality, calling in question the validity of any claim to water which has been made and kept up in good faith; rather will it afford opportunity for the final establishment of claims under the laws or customs in which they are grounded. Nor will the effect be in any degree to weaken the claims of riparian right. That right, presumably, and as maintained by those who invoke it, has its root in law antedating all statutory acts providing for granting privileges to divert waters or appropriate them. This present proposed measure is one only to effect the starting, on the part of the State, of an account of the waters, and will affect only the public as a whole, and those who divert, or claim the right to divert, the public waters under some statutory law or local custom.

As will appear from the draft of the second proposed measure next submitted, a main object of this account keeping, will be to make possible a system which will protect the interests of all, as they are fixed by the Courts—riparian proprietors as well as others.

THE SECOND MEASURE.

After this brief allusion to some of the main points of the first proposed measure, I now present the draft of the second Act, which, in my judgment, is necessary in the systemization and promotion of irrigation.

AN ACT

TO PROVIDE FOR THE CONTROL OF THE STREAMS OF THE STATE AND TO REGULATE THE DIVERSION OF WATER THEREFROM.

OF ORGANIZATION—WATER COMMISSIONERS AND WATER DIVISIONS, ETC.

[Enacting Clause.]

State Board of Water Commissioners.

Section 1. The Governor, State Surveyor-General, and State Engineer shall be ex officio members of, and constitute a Board of Water Commissioners for the State, to designate and organize water divisions, supervise the issue of water rights, the control of the affairs of the public streams, and the diversion of water from the same in such divisions, as hereafter provided.

The Governor shall be President of the Board. The office of the Board shall be in the State Capitol, and a deputy of the Surveyor-General, acting as Deputy Register of Water Rights, shall be Secretary to the Board.

Water Divisions. The State Engineer to report.

Sec. 2. Within thirty days after the passage of this Act, or as soon thereafter as may be practicable, the State Engineer shall submit to said Board a report or reports containing the result of his investigation as to water rights and irrigation, having in view the control and government of the streams of the State, and the regulation of the diversion of waters therefrom. He shall also make a special study with reference to the separation of the State into water divisions, each of which shall be composed of the whole or the parts of not more than five nor less than three counties, and include a group of streams which may conveniently, for the purpose held in view by this Act, be regarded as an hydrographic system, and shall report to the State Board of Water Commissioners the result of his examinations, and shall from time to time propose boundaries for such water divisions, and recommend their formation, commencing at the extreme southern portion of the State and proceeding regularly northwards.

Water Divisions. Organization of.

Sec. 3. After the State Engineer has reported the boundaries and recommended the formation of one or more water divisions, the Board shall proceed to consider the said report, and may adopt, amend, or reject the same; but if adopted by them, either in its original form, or as amended, they shall by resolution entered upon the record of their proceedings, declare the said territory to be, and the same shall thereupon become, a water division, and shall be known as Water Division Number One, Two, or Three, as the case may be, numbering the divisions in the order in which they are formed; and they shall record, in a book to be kept for the purpose, the boundaries, with map accompanying, of each separate division, its number and date of formation, and shall file for record with the Recorder of each county embraced, or in part embraced, in the division, a copy of the same, which shall be deemed sufficient notice of the formation of said division to all county officers, and to all parties concerned, that the said division has been formed.

Division Boards of Water Commissioners.

Sec. 4. Within thirty days after the organization of any water division, the Governor shall appoint a citizen, of the qualifications hereinafter specified, resident of each county in whole or in part embraced in the division, and the persons thus appointed in the division shall constitute a Board of Water Commissioners for the division formed. They shall hold office for two years, unless sooner removed for cause by the Governor, and until their successors are appointed and qualified.

They shall organize by electing one of their number President, and another Secretary, and shall take the usual oath of office; and shall each give a bond in the sum of ten thousand dollars, for the faithful performance of his duties, to be approved by the Superior Judge of the county in which the Commissioner resides, and filed with the State Board of Water Commissioners.

They shall, in all things, recognize the superior authority of the State Board of Water Commissioners, and of the Courts of the State.

They shall, on or before the first day of December, of each year, report to the Governor, as President of the State Board, all their proceedings, and the Governor shall submit the same to the State Board of Water Commissioners. The Governor shall fill all vacancies that may occur in any Division Board of Water Commissioners for the remainder of the unexpired term.

The Division Boards of Water Commissioners shall each meet alternately, at the county seats of the counties included in whole or in part within their division, and shall hold at least two and not more than four meetings in each county each year.

Division Water Commissioners. Qualifications of.

SEC. 5. No person shall be eligible to the office of Division Water Commissioner who is at the time of his appointment, or has been within one year preceding, the owner or part owner, or in the employ or pay of the owner or owners of any canal, ditch, flume, dam, water right or privilege upon a public source of supply as defined in this Act, within the water division of which he is a resident.

One less than the total number of Commissioners in a Division Board shall constitute a quorum for business; and a majority vote shall rule in the proceedings of the Board; *provided*, that no water privilege shall be granted unless the proposition receives the support of the members of the Board within or upon whose county boundaries the source of water supply courses.

Division Water Commissioners. Compensation of.

SEC. 6. The Division Water Commissioners shall each receive —— dollars per day for each and every day engaged in the discharge of his duty, to be paid monthly, out of the Division Water Fund of their water division. All actual expenses of Division Water Commissioners incurred when traveling or engaged on official duty, shall be paid out of the Division Water Fund of their division.

State Engineer. Expert to Division Boards.

SEC. 7. The State Engineer, in person or by deputy, shall be the engineer to each Division Board of Water Commissioners, and upon application shall be present at their meetings and advise the Board upon any points touching the water supply in the streams of the division, the extent of diversion and use thereof, the size and capacity of or for canals, and headgates, etc., the data for which he may have or can obtain.

Division Water Inspectors. Appointment of.

SEC. 8. Each Division Board of Water Commissioners shall appoint a Water Inspector for its division, and may employ, from time to time, such Assistant Inspectors as may be necessary to carry out the provisions of this Act and the duties imposed upon them, and shall prescribe their duties, fix their rate of compensation, and authorize the payment thereof.

Division Water Inspectors. Pay of.

SEC. 9. The Division Water Inspectors and Assistant Inspectors shall be paid out of the Water Division Fund of the division where they are employed. Such traveling expenses of the Division Water Inspectors and Assistant Water Inspectors shall be paid out of the Division Water Fund of the division wherein they are employed as may be authorized and ordered by the Division Board of Water Commissioners.

Division Water Rights. Schedule of.

SEC. 10. Immediately after the formation of any territory into a water division, and the organization of its Board of Commissioners, the said Board shall report the fact to the State Board of Water Commissioners. Upon the receipt of any such report, the State Board shall order, and the State Surveyor-General, acting as State Register of Water Rights, shall furnish, from his records, the Division Board with a certified copy of all existing water privileges within their division, entered in a book, and according to a schedule form adopted by the State Board. This schedule, with such additions and corrections as may be ordered thereafter by the State Board of Water Commissioners, shall constitute the guide for the action of the District Board of Water Commissioners in preparing to regulate the apportionment and diversion of water from the streams to the canals, ditches, etc.

Watercourses. Survey of.

Sec. 10. Within a reasonable time after the passage of this Act, the State Engineer shall make a detail survey of each source of water supply in the irrigation regions of the State, and shall make a map showing the location of the several channels or depressions through which the waters do now, or may in the past, have coursed, together with the lines of property division and ownership, embracing those districts where it may be doubtful as to which channel or depression the waters pertain, and he shall designate those in which the waters do course. From time to time, as he has completed these several surveys and maps, he shall file the result of his work in the form of a map and statement of facts ascertained, in the office of the State Register of Water Rights, and report the fact to the State Board of Water Commissioners.

Watercourses. Designation of.

Sec. 12. Upon the receipt of any such report the State Board of Water Commissioners shall consider the map and statement reported upon, and upon representation made to them, or further examination, they may amend, reject, or adopt the same. Whenever a map and statement concerning the watercourses has been adopted by the State Board of Water Commissioners, they shall cause a certified copy thereof to be transmitted to the Division Board of Water Commissioners within whose division the territory shown is; and the said map and certified copy shall serve as a guide in the matter of recognizing the watercourses or channels to which water is due, until it is ordered to be changed by the Courts.

Division Water Fund. Formation of.

Sec. —.

Memorandum.—The Division Water Fund in each division is to be formed by the proceeds of a tax levied annually on all property in the division. The Division Board of Water Commissioners is to levy the tax; the Tax Collectors of the counties to collect it, each in his own county, and transmit the proceeds to the State Treasurer.

Division Water Fund. Objects of.

Sec. —.

Memorandum—The Division Water Fund in each water division is to be used to pay the salaries of commissioners, officers, and employés, their traveling expenses, such contingent expenses as may be necessary in the carrying out of the provisions of the Act, and in removing small local obstructions which cause injury to the streams of the division.

Division Water Fund. Disbursement of.

Sec. —.

Memorandum.—The Division Water Fund of each district should be disbursed on accounts audited by the Water Board of the division; demands drawn by them on the Controller of the State, and warrants drawn by him on the Treasurer.

OF THE POWERS AND DUTIES OF THE BOARDS OF WATER COMMISSIONERS.

State Board of Water Commissioners. General Powers and Duties.

Sec. —. In addition to other duties and authority imposed upon and granted to the State Board of Water Commissioners by this Act, they shall:

Establish a uniform standard of measure for water throughout the State, and issue schedules illustrative of its application under various circumstances.

The *cubic foot per second* shall be the standard of measure for water diverted from the streams of the State for agricultural and mining purposes, and shall be adopted as such by the State Board of Water Commissioners.

They shall declare and adopt a standard quantity of water which shall be allowed to flow in all navigable streams, and which shall be exempt from the application of any right or privilege to divert waters from the said stream or its tributaries.

They shall notify each Division Board of Water Commissioners of any action of the State Board applicable to the streams of water of its division, and, from time to time, instruct them upon such points as may be necessary.

They shall supervise the actions of all Division Boards, receive and consider all protests against any action of any Division Board, and confirm or overrule the said action.

They shall report to the Legislature, during the first week of each session thereof, a full account of their proceedings had since the report last made, and a synopsis of the proceedings of all Division Water Boards during the corresponding period.

The said report shall be printed at the State Printing Office, the same as reports of other State officers, and two thousand copies thereof struck off for the use of the Senate and Assembly, and distribution from the office of the Board.

Division Water Boards. General powers and duties of.

Sec. —. The Division Boards of Water Commissioners shall each, under the supervision of the State Board of Water Commissioners, exercise exclusive and complete control over and administer the affairs pertaining to the streams and waters within its division.

They shall protect the streams—the banks, channels, and waters thereof—from unlicensed interference therewith; remove or cause to be removed local obstructions to the natural and free flow of the waters, and such structures as may, without authority, be hereafter placed in the bed or the banks thereof; cause the arrest and prosecution, before the proper tribunal, of all who may violate the provision of this Act; receive and consider all applications for new privileges, or the extension or increase of old privileges, as well as all remonstrances or protests against granting the same, pertaining to their division, which may be presented to them; and may, in their discretion, hear arguments and take testimony in contested cases, examine the field in all cases where contests arise or where they may desire to inform themselves concerning the exact situation of affairs, and perform such other duties as are herein specified.

Water Privileges. How Granted.

Sec. —. Whenever it appears from the measurements and statistics of the State Engineer Department, and the records of the State Register of Water Rights, that there is a surplus of water in any stream in a water division, at any time of year, available for storage or diversion therefrom and use, without liability of injury to any established interests dependent upon the waters and the stream below, the Division Board of Water Commissioners may, upon application therefor, grant a privilege to take and store, or divert and use, the said surplus waters. All water privileges shall be in writing, and issued upon a form or forms prescribed and provided by the State Register of Water Rights, and approved by the State Board of Water Commissioners; and shall be registered in full upon the Water Right Register of the division, as may be prescribed by the State Board of Water Commissioners. Whenever a Division Board of Water Commissioners grants a water privilege, it shall enter the minutes of the proceedings of the meeting at which such action is taken, in full upon their record or minute book, and shall transmit immediately to the State Board of Water Commissioners a duplicate copy of the water privilege so granted. All actions of the Division Boards of Water Commissioners in the matter of granting water privileges, shall receive the approval of the State Board of Water Commissioners before they shall be binding upon the State and final in their nature.

Water privileges. Nature of.

Sec. —. Water privileges may be issued as follows:

To store and use the storm, flood, or waste waters of a stream.

To divert from the natural channel and use the storm, flood, or waste waters of a stream.

To divert from the natural channel and use the waters of ordinary flow in a stream.

To catch or collect and use waste water from irrigation canals, ditches, or fields.

To catch or collect and use waste water from drainage canals or ditches.

To construct works, as hereafter specified, to effect each of the above mentioned objects.

Temporary privileges.

Water privileges may be temporary or final.

A Division Board of Water Commissioners may, when it appears that prior rights or privileges are not to be infringed upon, or paramount interests injuriously affected by such action, grant a yearly or temporary privilege to divert and use the surplus storm, flood, or waste waters, or the surplus waters of ordinary flow in a stream. No such privilege shall extend for a period of time longer than one year, and upon representations which will justify the action, it being made to appear to the satisfaction of the State or the Division Board of Water Commissioners that greater or prior interests will be made to suffer by reason of the granting of any such temporary privilege, the State or the Division Board may at any time, by resolution entered upon the minutes of their meeting, revoke such privilege. When any such privilege is revoked the holder thereof shall be notified in writing, upon a proper form, of the revocation of his privilege, and he shall thereafter be treated in all respects as not having a privilege to use or divert waters.

A Division Board of Water Commissioners may grant water privileges with the view of their being final, and notify the State Board as herein provided, and such privilege shall receive the approval of the State Board of Water Commissioners within one year after its issue, otherwise it shall be treated in all respects as a temporary privilege.

Water privileges. Works. How granted.

Sec. —. Any Division Board of Water Commissioners may, upon application, grant to the holder or holders of any water right or privilege recognized by the State Board of Water Commissioners, the privilege of constructing or reconstructing any dam, weir, or wing-dam in the channel or bed, or of constructing or reconstructing any headgate, canal, cut, or embankment in, along, or through the bank of any stream in their district, or of diverting and using an amount of water additional to that specified in their original privileges or right, when it shall appear to the said Board that other works, rights, or privileges of prior date or higher grade be not detrimentally affected thereby.

Any privilege to construct any work specified in this section, may be revoked by the State Board of Water Commissioners if it be made to appear to the satisfaction of the said State Board, within thirty days after the granting of the said privilege, that the existence of the work will inflict an injury upon any right, privilege, or work having a prior or higher claim, and all privileges granted hereunder shall be approved by the State Board of Water Commissioners before being final.

Apportionment of waters from the streams.

Sec. —. Each Division Board of Water Commissioners shall, between the first and tenth days of October of each year, make a schedule of water rights or privileges applicable to each stream or source of water supply, for the ensuing year, within its division, intended to serve as a guide in the apportionment of the water supply during the ensuing season amongst the several holders of rights and privileges.

This schedule shall name in its order as to priority of right or privilege each water right or privilege on the stream or attached to the source, the canal, ditch, or headgate to which it applies, its extent or volume in the standard measure of the State, and relation or proportion to the whole volume of the stream under the varied circumstances of supply which may be expected.

Memorandum.—This schedule should be published for fifteen days in at least one paper in each county in the district, and a copy sent to the State Board of Water Commissioners. Between the tenth and twentieth of November, the schedule should be finally considered by the Board and be adopted or amended and adopted. It should receive the sanction of the State Board of Water Commissioners before the end of December. It should then serve as a guide in the distribution of water during the ensuing year.

Forfeiture of privilege by non-user.

Sec. —. Whenever it shall appear to the satisfaction of a Division Board of Water Commissioners that good use has not been made of the waters diverted or claimed under or by virtue of any water privileges, or that they have not been used or diverted at all for the period of two years, the said Board shall by resolution declare the privilege should be revoked or curtailed, as in their discretion may appear to suit the circumstances of the case.

Such declaration shall be published for the space of fifteen days in one paper in each county of the division, and a copy sent to the State Board of Water Commissioners. After the expiration of a period of thirty days from the time of the passage of the resolution, the State Board of Water Commissioners may, in its discretion, according to the facts of the case and representations made, declare the privilege forfeited or curtailed, and so notify the Division Board.

Riparian rights. Protection of.

Sec. —. Whenever it shall appear to a Division Board of Water Commissioners that the supply of water in any stream in their district is not more than sufficient to satisfy the recognized and living rights, as elsewhere defined and limited herein, of riparian lands and the proprietors thereof, on the stream below, they shall by virtue of the authority vested in them by this Act stop all diversion of water from the stream and permit it to flow in its natural channel for the satisfaction of the said claims if demanded; *provided*, that it shall appear to the said Board of Water Commissioners that by so doing these demands, or some material portion of them, will be thereby satisfied, and the water will not be lost in transit in the sandy bed or beds of the stream intervening between the point or points of diversion and the locality where the riparian rights to be satisfied exist; or, if provided with the means therefor by those who hold water privileges, they shall construct such works as will supply all demands for water, for domestic and stock purposes, on the watercourse below, and economize the supply.

Interests of navigation. Protection of.

Sec. —. Whenever it shall appear to a Division Board of Water Commissioners that the supply of water in any stream in their division is not more than sufficient to preserve the navigability of the said stream, or, with other waters tributary, to preserve the navigability of the stream into which it flows, or keep up the supply therein as ordered by the State Board of Water Commissioners it shall be kept up to subserve the interests of commerce and navigation, they shall stop the diversion of water therefrom, when it is being diverted for any purpose held by this Act to be subservient to the said interests of commerce and navigation.

Declare the capacity of headgates and canals. Gauge record. Stream discharges.

Sec. —. Each Division Board of Water Commissioners shall cause a gauge record to be kept of the flow of water in all streams, canals, and ditches within their division, according to the form, and at the locality, designated by the State Engineer; and a condition of the granting of all water privileges shall be that the grantee or grantees, his or their heirs or assigns, will keep a proper record, as prescribed by the Board, of the flow of water in their canal, ditch, or headgate, as may be required, forever, and submit it to the inspection of the Board of Water Commissioners, or their Inspector of Waters, when required.

Regulations for the care of streams, etc.

Sec. —. Each Division Board of Water Commissioners shall, from time to time, establish, in addition to the adoption of a schedule of water privileges and rights, annually, as herein provided, establish general regulations, under and subject to which the diversion of water from the streams and conducting it to the place of use shall be carried on, and according to which the Inspectors and Assistant Inspectors shall perform the duties imposed upon them. All regulations adopted by the Division Boards of Water Commissioners shall be forwarded to the State Board of Water Commissioners for approval. The State Board may approve or suggest amendments or alterations to the same; and the regulations shall not be considered as finally adopted and in force until formally approved by the State Board of Water Commissioners.

OF RIGHTS, PRIVILEGES, AND WATERS.

Public and private waters. Definition of.

Sec. —. Waters which rise upon private property in natural springs, wells, or swamps, or which may be caused to rise by enlarging, clearing out, or otherwise improving such sources of supply; or by driving a tunnel, digging, boring, or driving a well upon such private property, shall be regarded as pertaining to the property upon which they rise, and belonging to the owner or owners thereof for use without noxious waste. But whenever any such waters have flowed without the bounds of the tract of land in one ownership upon which they have their rise, they shall be regarded as public waters and shall be subject to all the provisions of this Act; *provided*, that the sources of supply to all artesian wells shall be considered as public sources, and the act of tapping such a source by means of a well shall be considered as a diversion of water from it, and hence such diversion shall be subject to State control, to the end that the waters of the public source be not wasted.

All waters in the State not held in private ownership under the rule recognized in the first part of this section, are hereby declared to be and the same shall remain public waters of the State and subject to the provisions of this Act; *provided*, that rights to the use of water acquired before the passage of this Act under any law of the State or of the United States which are or may be established in the Courts of the State, shall be recognized by the State Board of Water Commissioners.

Public Waters. Dedication of.

Sec. —. The waters of the streams of the State may be used when necessary for the purposes herein specified, under the restrictions herein imposed, and according to such rules as may be established or concurred in by the State Board of Water Commissioners, and the necessity for water for the several purposes mentioned shall be deemed to exist in the order in which they are named, as follows:

1. For domestic purposes, and for the use of cities and towns.
2. To sustain the lives of and succor cattle, sheep, horses, and other live stock.
3. For the purposes of navigation and commerce on the streams.
4. For the purposes of agriculture, in irrigation.
5. For the purposes of mining.
6. For the purposes of manufacturing.

But in case of conflicts between claimants of water for diversion, in all instances the first in time shall be the first in right.

Riparian rights. Definition of.

SEC. —. From and after the passage of this Act, the sum of riparian rights existing as a claim or claims to flowing waters, at any particular period of time, upon any stream in the State, shall be held to be the right to have as much water flow to lands riparian to the stream as would in the order of and by the channels of nature, at that particular period of time, reach them, or be in the aggregate a supply sufficient for use, by means economical thereof, upon such lands as the water would at the time naturally reach, for domestic purposes and for the consumption of live stock kept thereon or pastured within one mile thereof.

Riparian lands. Extent of.

SEC. —. All lands bordering upon and extending a distance not to exceed one quarter of a mile back from the bank of any stream of running water or of the bed or channel of any stream in which water would flow so as to be available for domestic purposes or the consumption of live stock, if it were not restrained or diverted at some point above, shall be considered as riparian to that stream, and be entitled to riparian rights under the provisions of this Act, and as defined herein; *provided*, that rights which have been forfeited by the working of any statute of limitations, or otherwise under the law, shall not be deemed as revived by this section.

Water rights and privileges. Definition of.

SEC. —. The right to use or the privilege of using the waters or any part of the waters of any stream or source of water supply held to be a public source under the provisions of this Act, shall be regarded as holding good only to the extent of the amount actually conducted to the place of use; *provided*, that flood waters stored at private expense, the right to which is or may be recognized by the State Board of Water Commissioners, shall be regarded while yet in the reservoir as conducted to the place of use.

Of water rights and privileges.

SEC. —. When a right to the use of water from any source of supply is finally recognized by the State Board of Water Commissioners, or when a final privilege to use water from any source of supply, held to be a public source under the provisions of this Act, is issued according to the provisions hereof and recognized by the State Board of Water Commissioners, the said right or privilege shall be regarded as lasting for ninety-nine years, subject to the following restrictions, etc.:

1. To the conditions of the law under which it was acquired, according to the definitions contained in this Act.
2. To rules of the State Board of Water Commissioners and of the District Board of Water Commissioners (when approved by the State Board), which may be established to effect the equitable division of water according to the rights and privileges of claimants, and to prevent waste.
3. To prior or paramount rights according to the decisions of the Courts and the definitions contained in this Act.
4. To forfeiture by *non-user* for the period of two years.
5. And such other restrictions, etc., as the laws of the State impose.

OF PROHIBITIONS. UNLAWFUL ACTS.

Undue waste and loss of water from canals.

SEC. —. After the passage of this Act it shall be unlawful for any appropriator of water or claimant of a water right or privilege, or any person or persons, to divert waters from a public source of supply as herein defined, and suffer the same to waste by reason of insufficient or badly constructed or poorly maintained conduits; any such person or persons who shall violate the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction of the offense before a proper tribunal shall be subjected, etc. (Here specify punishment.)

Of artesian wells, and the waste of the waters thereof.

SEC. —. After the passage of this Act it shall be unlawful for any person or persons, the owner or owners of an artesian well, to permit the waters of the same to flow, except when they are being put to an useful purpose—one recognized as such by the Board of Water Commissioners of the water division in which the well is situated. Any person or persons who violate the provisions of this section shall, upon conviction before the proper tribunal, be deemed guilty of a misdemeanor, and subjected to, etc. (Here specify penalty.)

Prohibits the construction of weirs, etc.

SEC. 9. From and after the passage of this Act it shall be unlawful for any person or persons, except upon a permit in due form issued by the Division Board of Water Commissioners:

First—To construct, or reconstruct, any weir, dam, or wingdam across, partially across, or in the channel of any public stream within the boundaries of any organized water division in the State.

Second—To construct any canal, ditch, cut, headgate, or headgates in, alongside of, or through the banks of any public stream within the boundaries of any organized water division in the State.

Any person or persons offending against the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction before the proper tribunal shall be subject to, etc. (Here specify penalty.)

Prohibits the diversion of waters, etc.

SEC. 10. From and after the passage of this Act it shall be unlawful for any person or persons, except upon a privilege in due form issued or recognized by the Division Board of Water Commissioners:

First—To divert or cause to be diverted from the natural channel the waters of any public stream within the boundaries of any organized water division in the State.

Second—To enlarge or decrease the capacity or construct works which will have the effect of enlarging or decreasing the capacity of any public stream or branch thereof within the boundaries of any organized water division in the State.

Third—To add to or decrease, or construct works which will have the effect of adding to or decreasing, at any time or season of the year, the flow of any public stream within the boundaries of any organized water division in the State.

Any person or persons offending against the provisions of this section shall be deemed guilty of a misdemeanor, and, upon conviction before the proper tribunal, shall be subjected, etc. (Here specify the penalty.)

Diversion of waters against orders of Division Boards of Water Commissioners.

Sec. —. From and after the passage of this Act it shall be unlawful for any person or persons, possessors of any water right or privilege, or the managers, directors, or superintendents of any canal, ditch, or headgate, to divert, or permit to be diverted, through their works, any water from any stream within the boundaries of any organized water division of the State, when it has been declared necessary by the State Board of Water Commissioners, and ordered by the Division Board of Water Commissioners, that the said waters shall remain in their natural bed or channel for the satisfaction of the necessities and rights existing on the stream below. Any person or persons offending against the provisions of this section shall be deemed guilty of a misdemeanor, and, upon conviction before the proper tribunal, shall be subjected to. (Here specify penalty.)

REMARKS ON THE FOREGOING PROPOSED NEW WATER LAW.

THE ORGANIZATION AND EXPENSE.

Intent of the Measure.

The foregoing proposed law "to provide for the control of the streams of the State, and to regulate the diversion of water therefrom," is intended to take the place of the present water rights article in the Civil Code, and that of all the laws creating Boards of Water Commissioners in the several counties in the State, or delegating the power of Water Commissioners to Boards of Supervisors.

It provides a simple and economical organization for the management of the affairs of the streams, the apportionment of their waters according to the privileges or rights to them.

The Organization Proposed.

A State Commission is formed of three officers already under pay, and is given supervisory power over Commissions localized according to the natural hydrographic divisions of the country, and composed of one member from each county embraced, or partly embraced, in the local water division.

The local or division water Board has charge of the streams, and the watercourses, and the water diverted therefrom, and employs an Inspector and such assistants as may be necessary to carry out their regulations and schedules.

The body holding immediate power is thus near to the consumers of water and easily accessible to them, and becomes perfectly familiar with the field it is called upon to oversee. While the supervisory power—to look to the good of the State and the unrepresented interests, to harmonize local actions and conflicts, and to preserve uniformity of system amongst the several local Boards—is placed in the hands of State officers.

The Expense of the Organization.

The expense of this system to the State, over and above what it now is expending, will be the pay of one Clerk, or Deputy, in the Surveyor-General's office, to act as Deputy Register of Water Rights. To any county, it will be the pay and expenses of one Commissioner and the county's proportion of the Inspector's pay and expenses. San Bernardino County has had, for years back, three Commissioners, and her expense has been fully twice what it will be under the proposed system if it is adopted.

The Formation of Water Divisions.

These water divisions should be so made up that there would generally be no conflict between the Boards of adjacent divisions, for each division would contain a river system independent, at low water at least, of all others. For instance, the counties of San Diego, San Bernardino, Los Angeles, and Ventura embrace a river system flowing to the sea, independent of all others in the State, and might with propriety be taken as a water division under the measure, should it become a law. So also the counties of Kern, Tulare, and Fresno, (or so much of the latter as drains into Tulare Lake,) would be a well defined division. The San Joaquin Valley would have to be divided—that is, there would probably have to be two water divisions between Fresno County and Sacramento County—for that region would be too large to be efficiently attended to by one organization under this system.

Again, three, four, or five of the Coast counties north of Ventura, grouped together, would embrace a proper region to be formed into a water division, and the three counties east of the Sierra Nevada Mountains, Alpine, Inyo, and Mono, would form another suitable division.

I have thus indicated how this proposed law would probably be applied in the matter of forming water divisions, for the better explanation of the necessity for the adoption of the principle upon which it is based.

County organizations not efficient.

Streams run from one county into another, and hence county lines can not be adhered to closely in the matter of defining the boundaries of a region to be under one control in the management of them, unless we take groups of counties of varying number, as I have proposed to. For instance, Kings River forms the bounding line between Fresno and Tulare Counties, and then passes altogether into the territory of the latter. Its waters should be all under one control, as experience has shown.

THE REVENUE SYSTEM.

The proposed revenue system is simple in the extreme. A small amount of money is required to pay the expense of the administration. The Water Board levys a tax on the property of the division. The County Collectors collect it, and the Boards of Commissioners disburse it.

The proceeds of the tax are put into the State Treasury because no one County Treasury can be defined to put them into, and because the water division is really a State institution.

The tax is levied on all of the property in the division, and not on the irrigated or irrigation property alone, because it is to be expended in guarding the interests of all, and not of irrigators only. Those who may want water in the future have an interest in a care of a supply now. All have their interests guarded—the miner, the irrigator, the stockman, the owner of dry plain land who may want water in the future, the owner of hill lands who may want water for orchards in the future, the riparian proprietor who demands sustenance for his cattle. Hence all should pay their portion of the care of the streams. This is not a measure for irrigators alone. It is one for all interests. By it the State undertakes to take care of her own, and apportion her bounties according to the rights accrued, and those which she may give out in the future.

RIGHTS AND PRIVILEGES.

I have no apology to make for having undertaken to define rights where no satisfactory definitions now exist of them, and can only say that I have been governed solely by my ideas of what is just and right and essential for the prosperity of California. I am fully aware that some of these definitions are at variance with existing rules embodied in our laws, but I do not hesitate to say that sooner or later these rules will be modified, in some way, for the public good will demand that they shall be, so strongly and generally that the end will be effected.

Riparian Rights.

I do not believe it is either just or right, where the necessity for irrigation exists, that each owner of property on the bank of a stream should have complete control over the waters of that stream to the end that they shall be permitted to flow in their natural channel undiminished in quantity; yet this is essentially the claim of those who uphold the riparian principle. I can well understand that it is a principle which has come to us with the foundation of our law, and that in the absence of any later rule, forced to the front by the necessities of the people, the Courts must be governed by it; and I can see very clearly that the very existence of this principle engrafted on our laws has been, from one point of view, a blessing to the people at large in this State, for it has prevented the total appropriation and monopoly of water, throughout the southern half of the State at least; and I cannot but think that the centralization of control over water for irrigation into a few hands would be anything but a blessing.

Unreasonable claims.

And so in the past, each early settler on the bank of a watercourse has had the opportunity of protecting his right to water sufficient to satisfy his necessities, by the invocation of the riparian principle, but in so doing he has, in my judgment, been forced to set up an extravagant claim—the claim to have all the water run in the stream, whether he wanted it or not, while the appropriator has been put in a position where, in order to maintain his rights, he had to set up an equally extravagant claim—that of the right to divert all the water his canal would hold, whether he was really putting it to a useful purpose or not.

The laws of our State have forced these people into the positions they occupy. I do not think that as a general thing the representatives of either class of claims are as unreasonable as their assertions would seem to make them. It would appear to the dispassionate observer who will study the matter, it were to the interest of all, that this dissension be stopped, and that the only dignified course for the State to pursue is to undertake to stop it. Her laws have set up an irrepressible conflict. They stand in the way of the advancement of her material interests. It is absolutely necessary for the development of two thirds if not three fourths of California's territory that the waters shall be taken out of the streams and used for irrigation. And yet it will not do to throw open the gates to wholesale and unregulated appropriation of them. And, furthermore, there are rights in existence which must be respected. Surely it is the proper course to find out what those absolute rights are, where they exist, respect and guard them, and move on in the development of our resources.

The origin of our water right customs.

When title to property was first acquired in California the riparian principle, as afterwards brought in with our common law, was not recognized here. The people from whom we obtained this country with its climate, decidedly in all their customs and laws, crude and adapted to a lower order of civilization though they be, recognized that the waters must be used in irrigation, and gave the right to benefit by them to those who first acquired the privilege by use. This principle was engrafted upon Mexican statutes and the usages which grew up under them, by the Spaniards, whose climate more nearly resembles that of California probably than that of any other of the European countries. Yet the Spaniards recognize the paramount necessity for water for the use of cities and towns, domestic purposes, and to sustain the lives of domestic animals.

Origin of the riparian right principle.

Now, there exists no statutory definition of riparian rights. The accepted definition has its foundation in the decisions of Courts, and those decisions were guided by the necessities of the people in, and the equities of each particular case, under circumstances altogether different from those here presented. The climates of California and of England are as different as climates well can be in the temperate zones; the resources of the two countries are quite dissimilar, and the necessities of the people vary accordingly.

The necessities of the English people.

It has been essential to the happiness and prosperity of English society that the riparian principle should govern: the nobles wanted the water in the streams for its landscape effect in coursing through their parks; the merchant demanded it to float his vessels; and the manufacturer to turn his wheels; but no one absolutely required it to cultivate his fields. Hence, the riparian principle—that the owner of a piece of bank land has the right to have the waters flow in their natural channel whether he would really suffer by their diversion or not. In other words, the waters were not to be turned out of their natural course, not to be consumed or used up, and each proprietor was constituted their guardian.

The English recognized their paramount uses for water, and established a rule to suit the case. Water was not to be consumed or diminished in quantity in the streams. What use any one could make of it without materially reducing it in quantity or quality, they were permitted generally to make. Mills might be operated, fish ponds filled, fountains caused to play, and brooks to run through improved grounds, by the use of the waters but the waters themselves must be returned to the stream whence they were taken, undiminished in quantity and quality. Such was the rule in England; but when the English people obtained control of India and South Africa, recognizing the difference in climate and necessities of the people, they abandoned their riparian principle and took absolute control of the streams for the benefit of irrigation.

The necessities of our people.

Our necessities are almost exactly the reverse of those in England and similar to those in the colonies mentioned. Upon most of the streams in California, where, by reason of short supply of water there ever would be any conflict of interest, there exists no necessity for having the waters in the stream but to meet the requirements of a very few people and their cattle, for drinking purposes. And the fact is, that in the dry season nearly all of the water which remains in the natural channels, in the southern part of the State, is lost in their sandy and gravelly beds, never serving any immediate useful purpose.

While the need for water in the channels with us is generally a minimum, and the act of keeping it there results in its loss to every one, our plains, *mesas*, and foothills are barren and uninhabited, by reason of its absence from their soils.

The State's relation to the subject.

Certainly the State of California cannot permit the material prosperity of thousands of her citizens to be at the mercy of any one of them; and yet, if she upholds the riparian principle, or even limits the right (as has been very properly proposed she should do) without administering the affairs of her streams, that is just what she will do.

And still, if she ignores that principle, if she overturns the rights which have grown up under it, she will, in my humble judgment, leave open the way for the growth of water monopoly, which will be an equally undesirable result, unless she guards the door by a proper administration of the affairs of her streams.

The Definitions. Riparian Rights.

Regarding the subject in this light, I have endeavored, in framing the measure which I present, to be just, and be guided by a broad and liberal view.

I have provided for the determination of existing reasonable rights, and the administration of the streams so as to respect them.

I have proposed to define the riparian right to be a right to sufficient water for domestic purposes and the drinking purposes of animals, because no one ever thought of its application to prevent the material prosperity of the country, when it was engrafted upon our law with a different judicial interpretation, because the necessities specified are the only ones which actually exist to be satisfied, and because it is essential to the prosperity of this people that the definition should be as I have made it.

I have proposed to limit the riparian right to lands within one quarter of a mile of the watercourse, and bordering upon it, because it seems to me to be an absurd thing to lay down a general proposition which will make it possible that an owner of one foot frontage on a stream may claim the right to its waters for any number of square miles of territory, lying far away from it even, and which do not touch it except within this one foot of space. And I think it equally unwise to leave the decision of such cases to the Courts, without any rule to govern them, seeing that they cannot be informed of all the physical facts in each case, and can only take cognizance of those of which evidence is presented.

The distance, one quarter of a mile, is arbitrary—a mere matter of judgment—on my part, and it might well be made half a mile, or any limited distance; and seeing that I have proposed a system whereby riparian proprietors may be better supplied with water than they now are, and much water still saved for irrigation, I have no hesitation in saying that, in my judgment, in view of the necessities of the people of California, the riparian right is liberally defined as a right to a sufficient amount of water for stock and domestic purposes for a strip of land one quarter of a mile in width along the stream, and on many streams the width ought to be still further restricted.

The Rights of Diversion.

On the other hand, I do not believe that the State of California ever intended that water should be diverted from her streams and wasted in badly constructed works or in careless irrigation; yet, this is done all the time. The Civil Code (Part IV, Title VIII) says:

"The right to the use of running water * * * may be acquired by appropriation.

"The appropriation must be for some useful or beneficial purpose.

"A person desiring to appropriate water must post a notice * * * stating therein * * * the purposes for which he claims it and the place of intended use.

"Within sixty days after the notice is posted, the claimant must commence the excavation or construction of the works in which he intends to divert the water, and must prosecute the work diligently and uninterruptedly to completion, unless temporarily interrupted by snow or rain.

"By 'completion' is meant conducting the water to the place of intended use."

Hence, I have proposed to define the right acquired by appropriation as "holding good only to the extent of the amount actually conducted to the place of use." This will not include all waters diverted from the streams. The waters lost in transit from the source to the end of a canal will be subject to State control, and she may prevent their waste by insisting upon well constructed works.

Public and Private Waters.

In the definition of public and private waters, I have been guided by the already established rule, except that I have asserted the State's right to prevent the waste of water under all circumstances, and have declared the sources of supply of artesian wells to be public sources, as they certainly are. Artesian wells derive their supply from subterranean streams of water held in the pervious strata between some impervious layers of clay or rock. These streams have their origin in or near to the mountains, and flow under a vast domain. They are not private streams to each piece of property they flow under. The boring of a well into them is the tapping of a public source of water supply, in reality, and the diversion of water from that source. Hence the State should assume control over such waters, to the end that they be not wasted.

Dedication of Public Waters.

In the proposed dedication of public waters I have been guided by my idea of the necessities of the people of the State, and seeing that all existing rights are protected according to their date of acquirement, no hardship need result to any individual or class.

TO PROMOTE IRRIGATION.

WHAT CAN BE DONE.

Regulation necessary.

When the State shall have provided for a proper record of water rights, for the government of the streams, and the regulation of the diversion of the water therefrom: in other words, when she shall have reorganized her water right system, and started on a basis such as other countries possess, she will be in a position to systematize and promote irrigation in many different ways. Until she has taken some such steps, in my judgment, all measures designed to foster irrigation, and put it on a good business footing for the people at large, will fail of accomplishing their object. Doubtless some points may be guarded, some localities benefited, some classes of claimants bettered, some local interests fostered, but irrigation in the broad sense can never be put upon a good basis under the present water right system, or under any system which does not provide for State control of the diversion of water from the streams, and stop this custom of appropriating waters without regulation; and the reason is because he who appropriates without protection, except that provided by the Courts, does not get a claim *ab initio* which will justify proper outlay for works, and which will permit of a settled state of affairs between him and other claimants. Thus, protection is necessary, and this means *regulation.*

What may be done under a Water Right System.

When we have a proper water right system, the public waters may safely go into private hands for development, because the works will be executed and water distributed under State regulation. Opportunity will be presented for the safe investment of capital at low rates in irrigation enterprise, and it will not be long in seeking that channel of employment. The impecunious land owners can, by proper organization under State regulations, have their works of irrigation constructed by this outside capital, and secure long term contracts. But until this basis of all system is laid in the creation of a proper water right law and government of the streams, the tendency will be to unregulated monopoly of waters, because adverse claims cannot exist without conflict, which means loss; and hence one or the other will absorb its neighbor, not from mere greed of monopoly, but in self protection.

Further measures.

While I advance for adoption the two measures already proposed, considering that in doing so I am presenting a solution of the irrigation question, I am not prepared at this time to go further, and submit a draft of a bill, such as might be proposed, *to promote irrigation*, in further development of the system.

As I have said, the waters might, under a proper water right system, go into private hands with comparative safety to the public and the grantee of the right to divert and distribute them. Or provision might be made to organize irrigation districts of the State, as municipal or quasi municipal corporations, which districts could, under State protection, consummate and manage an irrigation of their lands.

I am under the opinion that both systems should be inaugurated, seeing that they would each be applicable and suitable under some of the circumstances that exist.

The State action.

As previously remarked in several places, I do not believe it would be good policy for the State to undertake the construction of irrigation works proper—that is, the canals of diversion and distribution.

I am of the opinion, however, that in all which tends to develop the water supply—the construction of deep dams in the streams to raise it to the surface, the construction of dams to store water in large quantities at the most favorable localities, the preservation of the forests, and even the cultivation of forests on the watersheds tributary to the streams of short supply in the southern part of the State—the State as a whole is so deeply interested that she may well adopt some broad and liberal policy on this point, and thus, having systematized her water right grants first, develop her water supply for the benefit of those who can use it.

General condemnation not necessary.

Finally, I do not think it at all necessary that there should be any general condemnation of existing water rights. If system can be established in the distribution of water from the streams, the waste of water prevented, and the price of water kept within reasonable limits, as I believe it can be, I fail to see any reason why a water right should be taken from any one, where works have been located with judgment and built well.

Where many little insignificant works exist and it is patent that they should be set aside for one or two good canals, it were better for all concerned that, under some organization, the existing rights be extinguished and the whole systematized.

With this view I present, in an appendix to this report, a rough draft, partially in memorandum form, of a bill called "*An Act to promote Irrigation,*" which, following out the system proposed heretofore, provides for the organization of irrigation districts. The draft is incomplete in its details, is not advanced as are those preceding, and is submitted to give an idea of what, in my judgment, is one of the ways in which organization for individual cases of irrigation enterprise may be provided for.

Even if such an Act were passed, it should not be applied universally by any means, but would find its application in the cases cited above and in cases of entirely virgin fields of irrigation enterprise.

Very respectfully, your obedient servant,

WM. HAM. HALL,

State Engineer.

APPENDIX A.

AN ACT TO PROMOTE IRRIGATION.

[Enacting clause.]

SECTION 1. The State Board of Water Commissioners, composed of the Governor, Surveyor-General, and State Engineer, organized under and by virtue of an Act entitled "An Act to provide for the control of the streams of the State and the regulation of the diversion of the water therefrom," shall have powers and perform duties as follows:

To define the boundaries of and organize irrigation districts of the State.

To order the condemnation of water-rights and privileges, and private or corporate irrigation property or works for public purposes, as defined in this Act.

Irrigation Districts. Preliminary report concerning.

SEC. 2. Within a reasonable time after the formation of any water division of the State, under and by virtue of an Act entitled An Act to provide for the control of the streams of the State, and the regulation of the diversion of water therefrom, the State Engineer shall make a special study with the view of dividing the same into irrigation districts, and shall make a preliminary report or reports of the result of such examination to the State Board of Water Commissioners, who shall consider the said report, and may adopt, amend, or reject it.

Upon the adoption, either in its original form or as amended, of any preliminary report of the State Engineer upon the subject of projecting irrigation districts as above mentioned, the State Board of Water Commissioners shall transmit a certified copy of the report together with a notification concerning their action upon it, to the Board of Water Commissioners, whose water division is thus reported upon. This report shall thereafter serve as a guide for the action of the division Board of Water Commissioners in the matter of recommending the formation of irrigation districts.

Irrigation Districts. Formation of recommended.

SEC. 3. Whenever it may appear to the Board of Commissioners of any water division of the State that any certain territory, a portion of their division, should be organized into an irrigation district, they shall give notice, by advertisement for thirty days in one paper in each county in their division, that on a certain day after the expiration of the period of advertisement they propose to recommend to the State Board of Water Commissioners the formation of an irrigation district of the State, embracing the territory described approximately. After the expiration of the period of advertisement, they shall definitely determine the boundaries of the proposed irrigation district, the source or sources of water supply for the same, and the rights or privileges, if any, it will be necessary to condemn for its use; and shall declare, by resolution entered in the minutes of the proceedings of a meeting of the Board, that the territory [describing it] should be organized into an irrigation district of the State; that the certain property or privileges [naming and describing them] should be condemned for the use thereof; that the said district should be provided with water from some certain source or sources of supply [describing them], through and by means of certain works [of which they shall give a general description], and that certain rights and privileges [naming and describing them] should be accorded it. They shall, within thirty days thereafter, transmit a copy of this resolution, accompanied by a map or maps illustrative of the descriptions, to the State Board of Water Commissioners, with the recommendation that the district be formed, the condemnations be made, and the privileges granted on application, as described.

Irrigation Districts. Formation of.

Sec. 4. Upon the receipt of any such recommendation the State Board of Water Commissioners shall, within thirty days thereafter, consider the case, and shall comply with the recommendations, refuse to comply therewith, or return the map and descriptions to the Division Board of Water Commissioners for amendment. The Division Board may amend their recommendations and descriptions and return the same to the State Board of Water Commissioners within thirty days thereafter, and the State Board of Water Commissioners may comply or refuse to comply with their recommendations as amended within thirty days after the receipt of the same. Whenever the State Board of Water Commissioners shall deem proper to comply with any recommendation of a Division Board of Water Commissioners, either in its original form or as amended, they shall declare, by resolution entered upon the minutes of a meeting of their Board, that the territory described shall be and is thereby organized into an irrigation district of the State, and that the works, privileges, etc., if any to be condemned, shall be dedicated to the use thereof and condemned for the public good. Upon taking such action the State Board of Water Commissioners shall formally notify the Board of Water Commissioners of the Division of the same, and shall file for record with the Recorder of the county or counties in part embraced within the boundaries of the irrigation district formed, a full description of the same, with map accompanying, which filing shall be regarded as full and sufficient notice to all county officers, and to all persons interested, that the said irrigation district has been formed.

GOVERNMENT OF IRRIGATION DISTRICTS.

Election of District Officers.

Sec. —. *Memorandum*—The Governor to order an election in the district for three members of a Board of Directors, and a Treasurer.

Method of holding the Election.

Sec. —. *Memorandum.*

Organization of the Board of Directors.

SEC. —. *Memorandum*—One of the number elected Chairman and one Secretary.

Compensation of District Officers.

SEC. —. *Memorandum*—The Board of Directors not to receive any compensation. The Secretary to be paid out of the District Maintenance Fund.

State Engineer by Deputy the Engineer to the Board.

SEC. —. *Memorandum*—The State Engineer shall, in person, or by deputy, advise the Board and supervise all plans and construction work.

District Employés. Appointment of.

SEC. —. *Memorandum*—Board of Directors shall appoint a Superintendent of irrigation in the district, a Collector of water rents, and Assistant Superintendents, and prescribe their duties, etc.

District Employés. Compensation of.

SEC. —. *Memorandum*—District employees shall be paid out of District Maintenance Fund.

District Construction Fund. Tax authorized.

SEC. —. *Memorandum*—Tax on the property of the district to be levied annually, proceeds to constitute Construction Fund.

District Construction Fund. Tax levy.

SEC. —. *Memorandum*—Board of Directors to fix rate of tax and make the levy, and notify Tax Collectors of county or counties.

District Construction Fund. Tax collected.

SEC. —. *Memorandum*—Tax Collectors of counties to make duplicate roll, collect tax in district, pay over proceeds to State Treasurer.

District Construction Fund. Objects of—

SEC. —. *Memorandum*—Object to pay for all works or rights condemned and dedicated to the district use, and to pay for construction of district works.

District Construction Fund. Disbursement of—

SEC. —. *Memorandum*—Board of Directors to audit and allow accounts, and draw demands on State Controller. Controller to draw warrant.

District Maintenance Fund—Authorized.

SEC. —. *Memorandum*—Revenue derived from sale of water to constitute the Maintenance Fund.

District Maintenance Fund—Water sold and Rates fixed.

SEC. —. *Memorandum*—Directors to fix water rates at such a figure as will yield sufficient revenue for cost of administration and maintenance of works.

District Maintenance Fund—Collection and keeping of—

Sec. —. *Memorandum*—The Collector appointed by the Directors to collect water rates semi-annually, account for the same to the Secretary, and pay over to the Treasurer.

District Maintenance Fund—Objects of—

Sec. —. *Memorandum*—Objects of fund, to pay salaries of employés, contingent expenses of administration, and cost of maintaining works in good condition.

District Maintenance Fund—Disbursement of—

Sec. —. *Memorandum*—Accounts to be audited and allowed by the Board of Directors and paid by the Treasurer on orders signed by the President and attested by the Secretary.

District Board of Directors. Powers and duties generally.

Sec. —. *Memorandum*—Generally—As follows: To levy the District Construction Tax; to determine how works are to be constructed; enter into contracts to construct works; direct the construction of works; examine and accept constructed works; apply for and serve water privileges for the district; generally superintend the business affairs of the district; appoint ditch tenders and assistants; appoint a Clerk or Secretary; establish and adopt schedule for distribution; fix rates for water; cause collection of water dues; direct and oversee the maintenance of works; examine and audit accounts against the Construction Fund; draw demands against the Construction Fund; disburse moneys of the Maintenance Fund; draw orders on the Maintenance Fund; to report to the Board of Water Commissions of the division; to report to the Governor.

RECAPITULATION.

State Board of Water Commissioners. General powers and duties.

Sec. —.

Memorandum.—Generally they shall:
Organize irrigation districts;
Extend or contract boundaries of irrigation districts;
Order condemnation of property and rights;
Dedicate property and rights condemned;
Issue water privileges to districts;
Approve long-term contracts.

Division Boards of Water Commissioners. Powers and duties.

Memorandum.—

Recommend formation of irrigation districts;
Recommend condemnation of works;
Recommend issue of privileges;
Supervise construction of works;
To approve regulations for distribution of waters.

Attorney-General. Power and duty.

Memorandum.—

Conduct condemnation suits.

State Engineer. Power and duty.

Memorandum.—

Report concerning irrigation districts;
Engineer to District Boards of Directors (by deputy);
To approve all plans of works under contract;
Accept all contract work;

Part V.

FINANCIAL STATEMENT FOR THE YEAR 1880.

REPORT.

To the honorable Senate and Assembly of the State of California:

The statements here submitted do not require extended explanation.

On January 10th, 1880, there was a cash balance on hand of the appropriation made for the investigation of the Irrigation, Drainage, and Mining Debris problems, of $8,158 21. The Secretary's statement No. 1, accounts for the expenditure of this money.

By the general appropriation bill of the last session of Legislature, the sum of $25,000 became available for the continuation of the irrigation investigation. The Secretary's statement No. 2, accounts for the disbursement of this sum so far as it has been expended, and shows a balance of $8,191 33 yet in the treasury to defray the cost of the irrigation work up to the end of the present fiscal year.

The Act to promote drainage made available the means for planning the engineering works contemplated under it. The cost of this work has been, thus far, $17,284 87, and this amount has been allowed by the Board of Directors of the drainage district formed, and paid, by warrants, as the law directs, on the Drainage Construction Fund. The Secretary's statement No. 3, accounts for the disbursement of this amount, it being an accounting in detail for the same amount shown in bulk in the accounts of the Board of Directors of the drainage district.

The Secretary's statement No. 4, is a summary of the stock account of the department, and shows a stock to be on hand to a valuation of $11,305 83.

Very respectfully your obedient servant,

WM. HAM. HALL,
State Engineer.

SECRETARY'S STATEMENT—No. 1.

IRRIGATION AND DRAINAGE.

Amount and classification of expenditures of State Engineer Department from January 10, 1880, *to May* 1, 1880.

RECEIPTS.

Balance in hands of Secretary State Engineer and Assistants, as per statement of Secretary, January 10, 1880	$325 28
Balance in State treasury, January 10, 1880	7,832 93
Total available cash	$8,158 21

EXPENDITURES.

Paid for services	$6,935 40
Paid for tools and implements	19 15
Paid for material	3 86
Paid for repairs and alterations	90 90
Paid for stationery	46 89
Paid for traveling expenses and subsistence	260 75
Paid for freight and expressage	130 15
Paid for telegrams and postage	105 44
Paid for miscellaneous expenses	362 45
Paid for provisions	65 50
Paid for forage	127 63
Paid for office supplies, furniture, etc.	10 10
Total expended	$8,158 21

Sacramento, January 10, 1881.

Wm. H. Hall, State Engineer:

Sir: I submit the above as a correct statement of amount and classification of expenditures in State Engineer Department from January 10, 1880, to May 1, 1880.

Very respectfully,

G. B. COSBY, Secretary.

SECRETARY'S STATEMENT—No. 2.

IRRIGATION.

Amount and classification of expenditures in State Engineer Department, from May 1 *to January* 10, 1881, *on account of irrigation investigation.*

RECEIPTS.

Amount of appropriation	$25,000 00
Received from sale of pack animal (donkey)	10 00
Total available cash	$25,010 00

EXPENDITURES.

Paid for services	$12,135 50
Paid for live stock (horses and equipments)	299 50
Paid for camp equipage and cook's outfit	39 44
Paid for boating outfit	5 50
Paid for instruments	285 68
Paid for tools and implements	31 15
Paid for material	17 48
Paid for repairs, alteration, and construction	215 65
Paid for stationery (drawing paper, maps, etc.)	205 58
Paid for traveling expenses and subsistence	933 65
Paid for freight and expressage	90 85
Paid for telegrams and postage	48 95
Paid for miscellaneous expenses	289 20
Paid for provisions	1,459 72
Paid for forage	369 68
Paid for office supplies (furniture, etc.)	141 30
Total expenditures	$16,566 83
Balance in hands of Secretary State Engineer and Assistants	251 84
Balance in State treasury	8,191 33
Total expended and on hand	$25,010 00

SACRAMENTO, January 10, 1881.

Wm. Ham. Hall, State Engineer:

SIR: I submit the above as a correct statement of amount and classification of the expenditures of the State Engineer Department to January 10, 1881, on account of the irrigation investigation.

Very respectfully,
G. B. COSBY, Secretary.

SECRETARY'S STATEMENT—No. 3.

DRAINAGE.

Statement of Amount and Classification of Expenditures of State Engineer Department for Drainage Work, for the term from May 1, 1880, *to January* 10, 1881, *allowed by Board of Directors Drainage District No.* 1.

For what purpose.	
Salaries and services	$12,913 84
Provisions	1,202 20
Material	85 15
Traveling expenses and subsistence	1,203 00
Repairs and construction	222 83
Stationery	325 85
Instruments	316 00
Teaming outfit (harness)	34 00
Forage	213 43
Tools and implements	156 02
Cook's outfit	34 65
Freight and expressage	92 95
Miscellaneous	410 15
Telegrams and postage	59 65
Fuel	7 00
Camp outfit	8 15
Total	$17,284 87

Sacramento, January 10, 1881.

Wm. H. Hall, State Engineer:

Sir: I submit the above as a correct statement of expenditures of State Engineer Department, on account of drainage surveys.

Very respectfully,

G. B. COSBY,
Secretary State Engineer.

SECRETARY'S STATEMENT—No. 4.

PROPERTY ON HAND AND ITS COST.

Live stock (eight horses)	$1,020 00
Rolling stock, consisting mainly of three light wagons, one buckboard, harness, etc.	1,394 60
Camp equipage and cook's outfit, consisting of tents, stoves, kitchen furniture, etc.	739 44
Tools and implements	882 71
Boats and boating outfits, steam launch and its outfit	2,405 50
Two arks, six skiffs, oars, anchors, ropes, chains, etc.	1,200 00
Instruments	2,095 00
Office furniture, drawing implements, etc.	550 58
For construction of apparatus, additions, and alterations to instruments and boats, to adapt them to this special service (properly included in their present cost)	1,018 00
Total cost	$11,305 83

Wm. H. Hall, State Engineer:

Sir: I submit the above as a correct statement of the classification and cost of property of the State Engineer Department now on hand.

Very respectfully,

G. B. COSBY, Secretary.

REPORT

OF THE

Board of Directors of Drainage District No. 1,

SHOWING

PROGRESS OF WORK TO JANUARY 1, 1881.

1v

REPORT.

Office of Drainage District No. 1,
Sacramento, December 20th, 1880.

To his Excellency Geo. C. Perkins, *Governor of the State of California:*

In compliance with the provisions of section four of an Act of the Legislature of the State of California, entitled "An Act to promote drainage," approved April twenty-third, eighteen hundred and eighty, the Board of Directors of Drainage District No. 1 respectfully submit to your Excellency a report of their proceedings by virtue of the powers conferred upon them, including the amount of work performed and the amount of money expended.

Drainage District No. 1 embraces practically all of that portion of the State of California drained by the Sacramento River and its tributaries.

The seventh section of the Act to promote drainage, provides that "after the formation of any territory into a drainage district, the State Engineer, as soon as practicable, after proper surveys have been made, shall submit to the Board of Directors of the district, plans, specifications, and estimates of the cost of the works necessary in said district, in order to secure a proper system of drainage therefor."

After the report of the State Engineer; as aforesaid, is made, the Board is requested to adopt, amend, or reject the whole or any portion of the plans presented, or to refer them back to the State Engineer for further report. After the adoption of plans and specifications, the Board is required to advertise for thirty days for proposals before any contract for work embraced in the plans can be let. This Board was appointed on the tenth day of June of the current year. The area of the district being so great, the magnitude of the interests involved so stupendous, and the labor to be performed by the State Engineer so extensive, that although the utmost diligence was exercised by that officer and his assistants, the plans and specifications could not be completed so as to enable us to let contracts prior to the tenth day of August.

The following reports of Wm. Ham. Hall, State Engineer—and furnishing the basis of our actions—will, we think, convey an adequate idea of the problem to be solved.

THE WORKS OF DRAINAGE FOR THE SACRAMENTO VALLEY.

Sacramento, June 25th, 1880.

Honorable Board of Directors, Drainage District No. 1:

Gentlemen: You have been called upon to carry forward such works of drainage as may be practicable and deemed necessary for the territory now known as Drainage District No. 1, and I, as State Engineer, am required to propose plans for and supervise the execution of these works.

The report to the State Drainage Commission.

The circumstances and views which have led to and governed in the formation of this district, are set forth in a report made by myself to the State Board of Drainage Commissioners, under date of May twenty-sixth, eighteen hundred and eighty, and which has been published, together with a copy of the record of the minutes of the proceedings of that Board, had at a meeting held on the twenty-eighth of May.

Drainage District No. 1.

Your district embraces all of the Sacramento Valley in which it will be necessary, as far as can now be seen, to execute works of drainage, except some of the low lands in the delta which is common to the San Joaquin as well as the Sacramento River.

The report to the Legislature.

In a general way, the drainage of this district—the Sacramento Valley—has been discussed by me in Parts II and III of my report to the Legislature, under date of January tenth, eighteen hundred and eighty. To avoid much repetition of argument in detail, I shall herein only briefly summarize the practical conclusions at large on this topic, and ask your attention to the papers referred to, for the discussions which have led to them. The broad facts in the case are as follows:

Facts concerning the rivers.

First—Generally, throughout its course, the channel of the Sacramento River as the main drain, and that of the Feather as its chief auxiliary, in their present condition, are incapable of affording passage for the waters of ordinary flood volume without subjecting a large portion of the great low-land basins and island swamps to inundation.

Second—The regimen of the Sacramento River is bad; its channel is of very uneven capacity in proportion to the demand for waterway, in the succeeding great divisions thereof, besides having serious local obstructions to flood flow.

Third—These defects, general and local, have, in a degree, always existed, but they have been largely developed of late years from causes still present or at work. The detritus from the mines is filling the lower Sacramento River and its principal tributaries, and an injudicious location of levees has unduly limited the width of flood waterway at important points and for long stretches of channel.

Preservation of the rivers.

It is desired to preserve these river channels. By the passage of the law under which we are called upon to act, the State has signified her realization of the importance of thus fostering the interests more directly affected by their deterioration, as well as those dependent upon the causes which in great measure produce this result.

The Act to promote drainage.

It is the object, as I understand the measure, to *promote drainage*—as the title of the Act implies—in accomplishing which it is necessary to do away, as far as possible, with the evil results of the flow of detritus from the mines, and to construct or develop waterway for the floods. Furthermore, it is expected that the accomplishment of this end will improve the navigation of the rivers and will facilitate the reclamation of swamp lands in the valleys adjacent, because it would be impossible to attain the primary object without doing much which will tend towards those kindred thereto.

GENERAL DRAINAGE PLANS.

Two general lines of action for the engineering solution of the river problems presented are frequently brought forward. They rest respectively upon what may be termed the Conservation and the Distribution theories of river improvement.

The Outlet or Distribution treatment.

To carry away the waters of flood, it has been proposed to supplement the river waterway by the construction of an artificial channel, or channels, on the route down the valley to the bay, thus effecting a division of the waters, and, according to the arguments of the advocates of this plan, producing a lowering of flood elevations and a shortening of high water periods. This is the plan based upon the theory that the greater number of channels in which the waters run, the less will be their flood elevations—a theory which I have called the Distribution theory, because of the distribution of the waters amongst several channels.

In the report spoken of, I have discussed this plan of outlet canals, and have expressed the opinion that it would not afford the desired relief from excessive flood heights, but, on the contrary, its primary result would be to bring about a further deterioration of the channel of the main river and impair its usefulness as a flood-carrying and navigable stream. I am led to this conclusion by the results of experience had in river improvements elsewhere, the records of which I have examined, and by the behavior of this stream itself under conditions observed during the past two years.

The conclusion rests upon the opinion now quite generally entertained by engineers, and based upon practical observation as well as sound principles, that the division of the waters of a sediment-bearing river results in the formation of bars in the channel below the points of diversion, and ultimately in the permanent contraction of the waterway in the proportion which the volume of water diverted bears to the volume formerly carried by the channel. The only exception to this rule is to be found within the influence of heavy tidal action, and where other conditions are present favorable to the tidal influence.

The Conservation treatment.

Holding this opinion, I have recommended the alternative course—a systematic treatment of the river channel itself throughout, with the view of developing its greatest possible carrying capacity, and of maintaining it in good navigable condition. This plan rests upon the idea that the greater the volume of water in a channel, the less may be, and generally is, its grade or slope, and hence a conservation of waters in a channel having a movable bottom will tend to reduce its slope and lower its flood elevations by scouring out the bottom material. This I have called the Conservation theory of river improvement.

The lower Sacramento River and its principal tributary, the Feather, have beds most readily moved by the action of the current, and the upper Sacramento has a channel which can be greatly improved by work hereafter to be discussed. Hence I have expressed the opinion, after an examination and measurement in detail, that their development can be carried forward to a stage at which capacity would be afforded for the passage of all ordinary floods; but I have said that the work must be one for a series of years, and that from the first, the great supplies of sand which are brought down the mining torrents, must be prevented from entering the larger streams of the valley.

A general plan of operations, according to the Conservation treatment, was sketched out in the report to the Legislature, heretofore spoken of, and it remains now to classify and mention the principal works which it will be necessary to prosecute, and this I now do, so far as these can be designated at present.

Some provisions in the law.

In classifying and pointing out the works which may be carried forward under your direction, I hold in view the provision of the law which stipulates that "all moneys raised * * * shall be used exclusively for the construction of dams for impounding the debris from the mines, * * * and for the rectification of river channels in which said debris flows within the drainage district," etc. (Sec. 24.)

This stipulation would seem to preclude the construction of any such work as a relief canal, and the building of levees for the protection of lands from inundations, but it does not prohibit the prosecution of any work which may be necessary for the impounding of debris or the rectification of river channels in which the debris flows. I hold that the works hereinafter designated are necessary to effect these ends, within the district whose drainage system you are called upon to improve, as I will endeavor to *show in each case.*

CLASSIFICATION OF WORKS.

Two general classes of works must be undertaken: the first, to withhold the sands from the main stream and private property; the second, to improve the channels of those streams so that they will maintain themselves, with a small amount of attention, subsequently, in the best possible condition, as flood-carrying and navigable channels. These works may be somewhat more definitely classified as follows:

Arresting the flow of the detritus—dams.

First—Works calculated to check the flow of sands into the navigable rivers from the mining streams. These will consist of dams composed of rough stone, brushwood, and gravel, or a combination of these materials, as the case may be, located and proportioned as may seem most favorable in each case.

Structures of this character should first be projected where the best conditions are presented for the test of their efficiency at a reasonable outlay of money. Other things being equal, the lower down such works can be brought on the tributary streams, the more certain they will be of accomplishing their object, and at small outlay of money; for lighter grades are found upon which to impound or rest the materials stored, longer crested dams are possible (over which the water will pour to a less depth and with less force) and less material will be left below the site unguarded or unrestrained.

The Yuba and the Bear Rivers present the best opportunities for this class of work, and the localities where it is most needed.

In a special report to be submitted concerning each of these streams, I will make recommendations and submit plans for the works which I deem advisable to undertake at once upon them.

Preventing the spread of the detritus—levees.

Second—Works calculated to guard against the spread of the waters from the mining streams, and consequent destruction of the channels in which they flow.

These will consist of levees, and those already in existence should be strengthened, raised, or protected from erosion, as may be necessary in each case, or new levees may be constructed where none are now in existence or the old ones are not worth adhering to.

The law provides that such works as are necessary for the rectification of the river channels in which said debris flows, may be constructed. Levees on each side of such streams as the Yuba and Bear Rivers, for instance, may be necessary to prevent the spread of their waters. Now the spreading of these waters results in the deposit of their sediment and the obliteration of the river channels. It is necessary, therefore, in order to rectify these channels, that the waters be not allowed to spread, hence levees are necessary; and hence, I presume, you will undertake this class of work.

Again, the Yuba and Bear River regions present the theater of most needed action, though along the shores of the Feather, also, as well as on the lower course of the American, existing levees must be maintained, if proper control is to be exercised over their waters, and the river channels preserved or improved. In a special report concerning work which should be undertaken this season, I will speak more definitely of this subject.

Checking the shoaling of the main rivers.

Third—Works calculated to guard against the further deterioration of the channels of the larger rivers, and exert an influence towards their complete rectification.

These will have for their immediate objects, (1st), the prevention of heavy bank caving, except where such may be desirable to effect some beneficial change in the stream alignment; and (2d), the closing, or partial closing, of all deep channels of escape for water from the main stream (such as the crevasses through the bank of the Sacramento River below Knight's Landing to Sacramento City), so far as these can be closed without causing other ruptures and the creation of other lines of overflow.

Bank caving—spur dikes and revetement.

The first one of the objects just mentioned, is to be attained by the construction of spur dikes of brush, stone, gravel, sand-boxes, or piling, or a combination of some of these, to deflect the current from the bank attacked, and create deposits for new bank lines. The Sacramento River above Colusa presents the field where it will be most necessary to conduct this class of work, for there are a number of points where the river channel is of exceedingly bad trend, owing to this caving of banks, and radical changes of the channel are threatened to the detriment of its uniform regimen as a whole, and consequent defeat of its rectifications—a leading object of the whole measure.

Deep outlets—gradual closure, overflow weirs.

The second object of this class of work is to be attained by entirely closing the breaks in existing levees, so far as it is safe so to do, with earth embankments, and by partially closing the remaining openings—the deeper cuts, at least—with structures of brush, timber, and gravel or stone, over which the water may pour, when it reaches a certain safe flood elevation, without damage to the structure itself.

I consider these overflow weirs an essential feature of the plan of improvement proposed, for the river from Knight's Landing to Sacramento City, and it may be necessary to apply them elsewhere along its course also. If there were means enough at command to construct at once such strong and large levees along the river, and to do such other work as would facilitate its scouring out and rectification, by the holding of all flood water, then the weirs might be dispensed with. But this would necessitate an outlay beyond the means at all likely to be at your disposal, and as the water will undoubtedly escape during floods at various points for some time to come, I propose that it shall find passage at such points and in such manner as will do least harm, and only at such times as the river channel may not be able to carry all presented to it.

Concerning the extent of this class of work to be done, the location and character of construction for the proposed weirs, I will shortly submit a special report for your consideration.

Promoting the deepening of the main rivers.

Fourth—Works calculated to cause the removal of bars in the river, where they exercise an unfavorable influence upon the uniformity of its capacity, and thus prevent general deepening by the scouring action of its current.

Several notable bars of this character and effect exist in the Sacramento River below the mouth of the Feather, and they are found, as is usual in such cases, where the bank lines are far apart, or where some irregularities of alignment in the banks exist and cause a check or eddy in the current and a deposit of sand as a result.

Removal of bars—spur dikes, parallel dikes.

Their removal is to be accomplished by the construction of spur dikes, or perhaps similar works parallel to the current—according to the circumstances in each case—of brush, stone, gravel, or timber piling, or a combination of these, in such manner as to cause a concentration of the current upon a judicious alignment, by contracting the channel to its normal width, and guiding the water in such narrowed channel up to an elevation equivalent to a low flood stage.

I may say here, by way of parenthesis, that dredging may be required in some of the bars, but this result is not expected generally.

As in the case of the last mentioned class of works, these constitute, in my opinion at least, a most important feature in the plans to rectify the channel of the river, and, as their position in this enumeration implies, should be carried forward before the final and completed effort is made to force scouring action by altogether confining the flood waters; because a condition of channel approximating a perfect regimen for the river is essential to success in confining its flood waters, and to approach such a condition local obstructions must be removed.

Correcting the alignment of the main rivers.

Fifth—Works calculated to straighten the river channel where, by reason of sudden and irregular turns or bends, a serious check is given to flood movements, and where the slope or grade of the country is less than that through which the river generally courses.

Under the proper circumstances a channel may be benefited in this way by making sudden and sharp bends less abrupt and angular, or by opening a new channel through behind such a sinuosity of the river course, which latter works are termed cut-offs.

Where a bend is very abrupt it may be made less so. Training the current against it by the use of spur dikes constructed on the opposite shore above, crowding the current out of the opposite bay by the continuation of the series of spur dikes from above down into it, and blowing down the point from time to time to be washed away, as may be necessary, will accomplish this result.

Cut-offs—Upper Sacramento River.

To cause the complete elimination of a bend from the course of the channel, cut-offs are made by clearing the path of the proposed new channel, cutting out a canal down to near low water mark upon its route, to a width of one tenth to one fifth that of the proposed channel, and forcing the currents of floods to enter the cut by a proper arrangement of spur dikes or other guiding works if it be necessary, and from time to time gradually closing the old channel as the new one becomes efficient by washing out.

The Sacramento River, between Colusa and Butte Slough and the mouth of Feather River, is a very tortuous stream, and narrow in proportion to its dimensions above and below. The grade of the country through which it flows for this division is much less than that above. Its capacity is much less than that of the divisions above and below under existing circumstances, and this is largely occasioned by excessive bend resistance due to the sudden turns in its channel and general tortuous course.

To bring the river to a good regimen it will be necessary, in my opinion, to diminish the abruptness of the most acute turns in this part of the channel, and shorten it also, by making some cut-offs. These can be carried out at a reasonable outlay of money, in a number of instances.

Prevention of cut-offs—Upper Sacramento River.

While it is necessary that the river's course should be straightened through the divisions from Butte Slough to the mouth of Feather, I hold that above Butte Slough, where the formation of cut-offs is most easy, and where they do occur naturally sometimes, all straightening of the channel should be prevented, because the river is already of much greater grade and cross sectional dimensions than it is in the division next below, where it is necessary, by making cuts and the other works spoken of, to increase its carrying capacity and thus accommodate the floods which are passed through the channel above.

Cut-offs—Lower Sacramento River.

Besides the points in the division mentioned from Butte Slough to Feather River, the only other locality where the cut-off treatment is admissible on the Sacramento River, is at the upper end of Steamboat Slough, where it is desirable to open up a new head for that channel, in the process of making it the principal line of escape for the flood waters. This subject is quite fully discussed in my report to the Legislature, and I will not say more upon it until I present the details in a special paper.

Forcing the scouring and enlargement of the main rivers.

Sixth—Works calculated to confine the waters of the river to its channel and cause an enlargement thereof by the scouring action thus brought about.

These works, of course, are levees, a complete system of which, from the highest point on the river where its waters escape into the back basins to the point where full tidal action is met at the foot of Grand Island, is essential, in my opinion, to success in the work of rectifying its channel and its final maintenance in an efficient and serviceable condition as a line of flood escape and a navigable thoroughfare.

Concentration of waters.

That the concentration and deepening of running water does increase its power to transport sediment, and thus bring about an enlargement of its channel, if the bed and banks thereof are of a character to be at all readily moved, engineers and others who study such matters are well agreed.

The confining of a greater body of water over the bed of the Sacramento River will undoubtedly cause its enlargement by the process referred to; and if local obstructions are removed in the manner heretofore spoken of or in any manner which may be necessary, this enlargement will go on so long as the waters are held in and the bottom is found to be of the character known to exist generally throughout the lower river, until the stream is much increased over its present dimensions: *provided*, that the extraordinary flow of sands by which the waters are now overloaded is checked in the mining tributaries.

The levee system.

It is frequently urged in argument against the levee system of river improvement, that the prevention of overflow causes the rapid elevations of the stream's bed as compared to the banks and back lands upon which the waters are prevented from spreading their sediments, and thus finally results in the overthrow of the levees, destruction of the lands, and injury to the river itself.

Although in the course of ages this result might, under the natural order of things, have been brought about by leveeing the Sacramento River, it is certainly a question of much less time, under existing circumstances, when the channel below the mouth of Feather River will be destroyed, if the whole river is not treated by the levee system; and as for the back lands, they can be no worse off than they are now in any event.

Deterioration of the Sacramento River.

This river channel is being destroyed by the sands which are rolled along its bottom, not by the fine sediments which are carried in suspension by its waters, and which only would be carried in large quantities out of it upon the back lands, if the levee were obliterated.

The escape of waters from the channel would not relieve it from the charge of solid matter which it annually receives, but would simply cause the permanent lodgment of that matter therein, whereas, by the confinement of its waters alone can the conditions be produced under which this detritus may be carried forward to the flats and marshes of Suisun Bay, where it will do less harm, for many years to come, than where it is lodging now.

We have had the low-water plane of this river raised two, three, four, and even five feet during the past twenty years. Such a rapid change was never heard of before in the history of other large rivers, and where the levee system, too, had equal scope for action. The bed of the Po, a river completely leveed, and whose waters are highly charged with sediment, has not been raised so much during the period of its recorded history. The levees of the Po may have caused a relative rise of several feet in its bed over that of its banks during the past two centuries, and so the levees of the Sacramento may ultimately have that effect. But the first effect of a complete levee system on this river, when it is brought to a good regimen and the flow of sands stopped, will be to cause a great scouring out of its bed and enlargement of its channel, and thus lower both its flood and low water planes, and many years will elapse before the effect of the levees in causing a contrary action will be felt.

The Mississippi and the Sacramento.

A river such as the Mississippi, whose great defect in capacity is due to the very shoal bars caused by caving banks and great irregularity of width, can have its waterline sufficiently lowered by the simple scouring out of these shoals to carry its floods between banks without a levee system as a necessary part of the plan.

Not so, however, with the Sacramento. We must remember that such is not the principal cause of deficient capacity in our river. Its banks are quite stable where the capacity is small; but few shoals exist to be removed, and these, although their continued presence would prevent a general improvement of the channel, are not themselves the principal cause of its inefficiency.

The Mississippi River, with a flood discharge of one million two hundred thousand to one million four hundred thousand cubic feet per second due to it, carries over or in its main bed from five sixths to nine tenths of its waters, losing one sixth to one tenth only into the swamps at high flood stage.

The Sacramento River, between Butte Slough and the mouth of Feather River, with a flood discharge of eighty thousand cubic feet per second due to it, carries through only thirty thousand, having lost into the back basins on its course nearly two thirds of its waters. There is no considerable obstruction to flood flow from shoals in this part of the river. The channel is narrow, has firm banks, and is exceedingly crooked.

The floods rise to their maximum height in the upper portion of this division next below Butte Slough, and overtop levees three or four feet in height before the water is bank high at Knight's Landing, twenty or thirty miles below.

Defects of the Sacramento River.

As before remarked, these divisions of the Sacramento River—from Butte Slough to the mouth of Feather River—are in need of something more than the sweeping out of shoals. The channel must be straightened and heavily leveed to facilitate and force its enlargement throughout.

This river is naturally too small for the amount of water that is presented to it generally throughout its course, because, for ages past, so large a portion of its volume, at time of flood, has, from local causes, escaped into the back basins, that the channel way has become contracted. The proof of this action is found in the fact that below every escape channel of note, all along its course, there is a radical diminution of average cross sectional area: and furthermore, as the water has escaped gradually over the banks all along, there is a gradual diminution in width found in going down stream through each grand division of the river, from one large outlet or tributary to the next below, until we arrive at the region below Grand Island, where the tide has full sway and its flow regulates, in a great measure, the width and depth.

The popular idea of filling the low basins.

We have frequently heard that the Sacramento River should be allowed to overflow its banks so that the low basins might become filled up. It may be remarked here, with propriety, that these basins would not fill up unless the river deserted its present course and occupied them in turn as channel ways. The river bed and its immediate banks were naturally built higher than the basins before the advance of the sands from the mines, and they would probably continue to rise more rapidly than the basins, for the sediments brought down by the waters of such streams are, for the most part, deposited immediately on the bank which is naturally overflowed, and it is only when the waters escape with force through a crevasse that the solid matter is carried far back into the basin and elevates it commensurate with the rate of elevation of the river bank and bed.

The true idea of this matter.

Thus the only way to equalize the land elevation back from the river to that along its bank would have been to levee the river and force streams of water back to the basin through channels, and there cause the deposit of their sediments.

But as the river has received this charge of sand, which cannot thus be sluiced out on to the low lands, to any great extent at least, and as the preservation of the river is the object in view and not the filling up of the basins, there is still greater necessity now for a complete confinement of the waters between levees.

I refer in the above to the Sacramento River below the mouth of the Feather, and presume that the object is to preserve and improve its channel. That this river itself could be turned into the basin which flanks it on the west, and there be made to deposit its sediment for some years to come, is quite certain; but the result would be destruction to the present channel. and the future would be altogether problematical with the land and cities below the point of turning.

Necessity for a levee system on the Sacramento and Feather Rivers.

After the other works which have been hereinbefore spoken of have been well taken in hand, the general leveeing of the river should begin. This work should be prosecuted from the upper portion of the stream downwards, in the reverse direction from that of the other principal improvements. The channel itself should be cleared of local obstructions from the lower end up, to bring about the conditions under which it will profit by the effects of leveeing and confining its waters, and then this forcing should commence at the upper end.

The first leveeing that is undertaken, therefore, other than that necessary to equalize banks along the river generally and close gaps as before explained, should be from Chico Creek to Butte Slough.

In my report to the Legislature, already referred to, will be found some general suggestions for the disposition of the levees along this part of the river as well as through other divisions. In special reports on the subject, hereafter to be submitted, the matter will be treated more in detail.

OTHER WORKS.

I have now classified the works which it is essential should be carried forward for the rectification of the main rivers of this valley, and have indicated, in a general way, the localities where they are to be undertaken, and the order of their proper progress.

In addition to these it may be necessary, as time goes on, to execute other works, some of them of considerable magnitude, in order to relieve the large rivers of the load of silt which is brought to them, and insure their continued improvement, as well as to otherwise dispose of flood waters, if the drainage of the valley is to be made complete.

Diversion of tributaries to deposit detritus.

For instance, although the Sacramento River itself cannot with propriety and safety be turned into any of the low basins which flank it, as a means of disposing of the sands, the case may be different with several of its tributaries, notably the American and the Bear Rivers, which might be led to deposit their sands in the low basin lying between the two on the east side of the Sacramento. Indeed, they both do so now in a degree, and during the past season the Bear River has shown a strong disposition to turn to the south altogether and desert its former mouth into the Feather for an outlet into the basin mentioned.

An examination in detail of the practicability and cost of thus disposing of the sands of these two troublesome tributaries will be made under my direction during the present season, and will form the subject of a special report at a later date.

Diversion of the Coast Range Creek flood waters.

And still again, the disposal of the waters of Putah and Cache Creeks, which flow into the Yolo basin, is an essential part of a complete system of drainage for this district, if not absolutely a necessary operation in the rectification of the main river channels. This project is discussed in Part II of my report to the Legislature, and I invite your attention to the views there advanced.

In my opinion, these creek waters should be turned through a high grade canal over the Montezuma hills, to an independent outfall in the slough north of Suisun Bay. By this means only can the great accumulation of water in the Yolo basin be prevented, the levees of the river be maintained and rendered efficient at reasonable outlay, and the success of the drainage of the valley be rendered complete.

GENERAL REVIEW OF THE RIVER TREATMENT PROPOSED.

Glancing over what has been said in this report, and in that made to the Legislature in January, it will be found that I have advocated the Conservation treatment in the improvement of the main rivers of this valley; that I propose to bring the channels to a good regimen—even capacity to do the duty required—by straightening them where necessary and admissible, by scouring out shoals where these exist, particularly in the lower river, by training the current to destroy great eddies, and by preventing the local escape of flood waters in large volume, and to supplement its present capacity by raising levees which will themselves form a larger channelway and force the enlargement of that already existing by the scouring action of the confined waters.

A system of levees necessary.

And I hold that a levee system is necessary to preserve the existing channels of the Sacramento and Feather Rivers and to accomplish their rectification.

If these channels were more nearly proportioned in size to the volume of water which comes down the valley, and like many other streams, were deficient in capacity merely because of local obstructions, such as extended bars, their rectification could be accomplished without the levees. But, as has been shown, such is not the case, and we can only accomplish the object through the medium of a levee system.

Could we sweep out of existence all levees now standing along the Sacramento and Feather Rivers, the floods would spread into the back basins at many places, and there, finding shorter lines of escape from point to point on the rivers, would pursue these routes, robbing the channel in some of its divisions of the waters due to it and necessary to preserve its size, and gorging the channel with more than it could carry at other points.

The result would be the contraction of the existing channels in some of their divisions and the formation of new outlets or the enlargement of those already in existence, until, by the action of some great flood, the channel of the river itself would change materially. This is just what was going on before leveeing commenced here.

Now there are levees over four fifths of the route of the river within the district where their waters could naturally escape into the back basins. These levees are of very uneven height, and some of them badly located. If they are left in their present condition, and an attempt be made to improve the channels, what will be the result? Manifestly a more unfavorable one than if there were no levees at all. The waters would escape where the levees are weakest, or where there are none, and in large volume locally, as they do now in reality, and the river could not be brought to a good regimen, for there would be no control of the floods, which would leave the channel or return to it whenever opportunity offered; and without a nearly perfect regimen we can hope for no general improvement in the channel.

The object is to prevent the further deterioration of these rivers and to improve them.

The detritus lodged in the river beds must be disposed of, and the channels otherwise rectified and enlarged. It is absurd to talk of dredging them all out, as has been publicly suggested. Twenty millions of dollars would not more than free the two rivers by this process.

A portion of the sediment should be used in levee construction, but the great mass must be swept out by the river currents. This can only be accomplished by putting the rivers in condition to facilitate this action, and by a control of all ordinary floods; and a system of good strong levees is essential for this treatment.

Such a system as is necessary for this purpose, however, will not effect the complete reclamation of all the swamp lands in the great basins of the district, but of course would do much toward that end. There would still be a necessity for organized action in the reclamation districts which must continue to exist and each labor in its own behalf, while the drainage work will be for the common good of all. This subject is more fully touched upon in a report submitted by me to the State Board of Drainage Commissioners, under date of the twenty-sixth of May, and to that paper I ask your attention.

AN ESTIMATE OF COST.

Concerning the probable cost of the works herein outlined, I can only at this time give a rough idea. To construct levees of proper size entirely anew along the Feather and Sacramento Rivers where necessary within this district, would cost in the neighborhood of three millions of dollars.

It may be said that one third of this work has been accomplished efficiently thus far, so that it could be made a part of the work of the future. We have then a balance of two millions of dollars to be expended on this class of work.

An estimate of what might be expended to advantage within the next ten years may be made, as follows:

Levee work	$2,000,000
Channel corrections, etc.	2,000,000
Storing sands	1,000,000
	$5,000,000

Fully one half of this work is such as the general government might possibly undertake for the preservation and improvement of the rivers as navigable streams, but it must be brought forward in its order with the other works, and cannot be left behind, else the whole will be a failure.

The work should be so carried on as to diminish the time of execution as much as possible; there would be economy in such a course, for they will undoubtedly cost more unless put in final condition as fast as natural action will permit.

Supposing the five millions of dollars were expended during the next ten years, I estimate that the cost of maintenance would be about two hundred thousand dollars per annum after that period, half of which would be for storage of sands and half for river works; and the general government might be expected to bear half of the expense if it pursues its present policy in river works.

The maintenance of levees, while properly remaining under the direction of the Drainage District Boards, should ultimately be paid for by the lands thus protected from inundation, and thus the State's share of the expense of maintaining her rivers in good condition will, in the future, be reduced to a small amount.

Very respectfully submitted. WM. H. HALL,
State Engineer.

REPORT ON DAMS FOR THE STORAGE OF MINING DETRITUS ON THE YUBA AND BEAR RIVERS.

Office of the State Engineer,
Sacramento, July 6, 1880.

To the Board of Directors of Drainage District No. 1, Sacramento, Cal.:

Gentlemen: In the matter of constructing dams for storing mining detritus on the Yuba and Bear Rivers, I have to report now in general terms, and when further examinations shall have been made of the several sites for dams and storage ground, I will submit another report concerning the same, and recommend the adoption of a definite policy on each river.

Transportation of sediment by moving waters.

The conditions in a stream most favorable to the transportation of sediments by its waters are: (1), that it be deep in proportion to its width; (2), that it be of uniform width and grade; (3), that its channel be of good alignment, free from sudden bends; and (4), that the lines of its currents be not broken up by obstructions of any kind.

With such conditions, a rapid current, uniform in its movement throughout the several succeeding reaches and divisions of the stream, with a sharply inclined vertical velocity curve, would be produced, and the waters would have great power to transport solid matter.

Reversing these conditions in any manner, the waters drop their silicious or earthy load in a degree proportional to the extent of the reverse order produced. Thus, sediment-carrying currents may be made to deposit their sand and slimes by checking the velocity, and otherwise destroying the conditions essential to their transporting power.

This may be effected in either one of three ways: (1), increasing the width of the stream, thus reducing its depth as a direct consequence, and indirectly reducing it also by causing the raising of its bed by deposits thereon; (2), reducing the grade or slope of the stream by changing its alignment, or by raising its bed at some point by a dam; (3), breaking up the threads of its current by the introduction of pervious or partial obstructions to its flow.

The Yuba and Bear River deposits.

The Yuba and Bear Rivers have made immense deposits of gravel, sand, and slime above their confluence with the Feather, because their grades greatly diminish as they approach that stream, their waters have overtopped the low banks and spread in wide sheets over the adjacent bottom lands, and the dense growth of small timber and brushwood through which they were made to run broke up the lines of their currents.

Deposits in this manner occasioned at lower points, have served to reduce the grade for other points above, and thus, there also, filling has taken place; and still again, in the cañons the natural irregularity of regimen, and the damming up occasioned by the lower mining dumps, have made many extended reaches the storehouses of heavier detritus.

Proposed artificial deposit of detritus.

Now it is proposed to cause an increased deposit from the waters of these streams, at such points that it will not damage private property or injure the navigable main drains below.

So far as the currents of the Yuba and Bear Rivers themselves are concerned, it matters not whether they are either restored or supplemented by other deep ones, so long as the objects just expressed are attained. Indeed, the primary object being to preserve and improve the channels of the main drains or navigable streams—the Sacramento and Feather Rivers—it would seem to be advisable to avoid any immediate restoration of the channels of the tributaries; for materials washed from them must pass down into these larger rivers, and it is important to withhold all the sand that can possibly be held back, at least until such time as they—the rivers below—can have been brought to a good regimen and scoured out.

In view of this condition, I recommend that the treatment for the Yuba and the Bear be such as to retain their channels, for years to come, at least, somewhat as they now are, in wide and shallow beds; and rather encourage further deposits upon the sand wastes already formed (where this can be done without great damage to other yet uninjured property), than to cause the restoration of any deep channels through these deposits.

This treatment should be pursued until such time as it shall have been shown that the sands are stopped at higher points, and the large rivers below are, in a great measure, relieved from their filling.

Locations for and character of dams.

Within the cañons of the mountains through which the Bear and Yuba flow, it is not possible by any direct method to widen the channels. This can only be accomplished by building up their beds through the action of dams, thus effecting the double object of increased width and decreased grade above each dam.

The subject of retaining the detritus by means of stone dams within the cañons of the Yuba River was discussed by me in Part III of the report to the Legislature, submitted in January, and allusion was made to the possibility of effecting the same end by means of dams of brush and gravel at lower points on the same streams.

Further observation and thought have convinced me that the work should be commenced as low down on the streams as the detritus can be held safely, and that the dams built must at first be of the latter mentioned class.

The sands stored at lower points will themselves serve, to some extent, as dams for storage sites at points above; and furthermore, brushwood is the only material to be had at some of the sites for dams, and these structures must be built of it if at all.

A brush dam possesses the advantages of greater stability and safety on soft or sandy foundations, and great cheapness of construction.

A rock dam has in its favor the considerable advantage of the durability of its material and of stability under great floods—supposing, of course, its foundation to be secure.

Upon the wide sand flats below the cañons proper, undoubtedly brush dams should be adopted, primarily, at least; while between the high banks of the foothills, rock dams, where material is abundant, can be most conveniently built, and would have the advantage of permanence to a degree which should render their ultimate adoption advisable.

Storage below the cañons.

Were the sands stopped at the cañon mouths on the Yuba and Bear, it would still be necessary in preventing the channeling out at lower points through the sand wastes above the Feather, to lay in some low brush dams or sills, as heretofore alluded to, in order that these lower sands might not be swept down before the large rivers could receive them safely. This being the case, it will be wise to make these obstructions do the additional duty of holding more sands if possible, and hence at the lowest point where this can be done with safety, the first dams should be built.

All of the sands which will come down these streams for several years can be thus stored below the cañons proper, on lands already covered; and, by an extension of leveeing work, still greater storage capacity can be obtained over the same superfices.

Stone dams commenced with brush.

The great danger of destruction to a stone dam of the character and for the purposes it is proposed to build them on these streams, is from undercutting at its down stream edge, and in building of stone alone it is difficult and expensive to guard against this action.

With brush, however, this difficulty is much more readily met, and it is proposed to protect the stone dams by submerged brush dams at the down stream edges of their aprons. These brush dams, by raising them higher, can be made to retain a large amount of sand above them before the stone dam is commenced, and hence, again, we have sound arguments not only for the construction of the first dams low down on the streams, of brush, but for the commencement of all dams with that material.

THE STONE DAMS PROPOSED.

It may be well to consider here for a moment the principles upon which we are to proceed in the matter of constructing dams, both of brush and of stone.

Stone dams—character of.

The proposed stone dams would be massive structures of loose rubble, not coursed or hand-laid, but somewhat assorted with respect to size of pieces, as hereinafter explained, with crests ten to twenty-five feet in thickness, and long slopes both up and down stream.

For a clear idea of the problem of these stone dams, it is essential to remember that they are to be for the purpose of storing sands, and not water, and that it will not be necessary, under a proper system, to have any one of them more than twenty feet—say an average of twelve feet—in height, at any time, over the bottom immediately up stream from it. Hence the dam becomes but a facing for an upper plane of sand; it becomes filled and impermeable only by degrees, as the sands rise upon it; and the hydrostatic pressure behind it is always limited to that due to but a few feet in depth of water. Such a dam is intended to be added to each year, using the filling above as a foundation for a portion of each addition, until the structure is brought to the desired height for its site and becomes solidified with the filling against it.

Stone dams—their weak points.

If rocks of sufficient size are used, its destruction could only be accomplished: (1), by the water finding a low place in the crest, and there concentrating its force; (2), by undermining; or (3), by flanking its ends.

The mere pressure of water or shock of a flood could not overthrow a dam of this kind; so that its destruction, if ever accomplished, could only be gradual, and not a sudden catastrophe.

Ordinary care in construction and maintenance, and the use of very large stone on the crests and down-stream faces, would prevent damage from channeling down and concentration of waters at any point.

Ordinary good construction, too, will insure against the ends being flanked by the floods, for the water may be kept away from the extreme ends of the crest, and a good junction may be made with the bedrock in the faces of the hills.

On the foundation, we have the weakest line to guard.

If large rocks—say twenty tons apiece—be laid in a row on the sands across the bed of a river, such as the Yuba or the Bear, they will quickly disappear—the sands from between them will scour out, the rocks will gradually drop into the cavities produced, and will soon have disappeared almost entirely, if not quite.

If the same quantity of stone, broken to the size of ordinary river gravel, be placed in a ridge across the channel in a similar locality, it will not be undermined; the top stones will be swept off, probably, one by one, by the force of the current, and the whole ridge flattened down, in time possibly destroyed by this means, but it will not be dropped out of sight, in the sands, by the action of the current passing under it from above. If there should be considerable fall over it, and no apron or flat surface of stones below, the sands would probably be swept away from its down-stream edge, and the stones or gravel would be washed into the cavity thus formed.

Here we have a picture of the manner in which a rubble-stone dam may be undermined, either by the water running along upon the sands, by way of the spaces, between the stones that compose the structure, from above, or by the cutting under the lower edge of the structure after having passed over its crest.

Stone dams for storing detritus—principles to be observed.

Should we imagine a dam built up in thin layers, the material in each succeeding one graded in size somewhat larger than in the layer below—from the dimension of the particles of sand up to those of the great mass of rock capable of withstanding any force of water that can possibly be brought to bear upon it—we would have before us a dam totally incapable of destruction by undermining from above, because the interstices between the particles of no one layer would be sufficiently great to admit the passage of a stream of water strong enough to wash out its particles or those in the layer next below.

In the construction of stone dams to store the detritus on the Yuba and Bear Rivers we must approach this condition in their parts; the sands under the foundation must be covered so that the waters of percolation will not wash them; the rocks upon the crests must be of such great dimensions that the force of the water cannot move them, and the pieces of the intervening material must be intermediate in size.

Practical construction of stone dams.

The foundation may be secured by first depositing layers of very fine stone upon which to build; or the same object may be attained by building the stone dam upon a foundation mattress or matting of small brush, with fine stone or gravel intermixed.

Having secured the foundation from washing above, the undercutting at the toe must be guarded against.

First of all, for a considerable width below any overfall, there must be an apron to receive the shock of the waters and permit of their taking a horizontal direction in the onward flow, before reaching the movable bottom.

This apron, of course, would be most durable if constructed of stone, provided its undermining were guarded against, and to a stone dam there should be a stone apron, though one of logs or of brush and gravel might be used safely for years.

The lower edge of such an apron, of whatever material composed, unless it were of very great width and the water spread over it in a very thin sheet, would be liable to suffer from this undercutting influence, unless the transporting power of the water were broken up at that point.

Flowing over or past a hard and fast line, such as the edges of a stone or log apron would be, water almost always attacks the soft material adjacent to it, and cuts a hole or pit. On the contrary, a windrow or driftrow of brush, lodged in a current so that the waters partially pass between the branches, causes a deposit of sediment and the formation of a bar below, which works up to and finally covers in the brush itself.

By a proper construction and the use of brush on this principle, with which to finish the lower edge of the stone aprons, not only may their undercutting be prevented, but the sands may be caused to pile up where it might be supposed they would cut out.

I do not propose to consume time and space in citing instances where like effects have been artificially produced in engineering work. Suffice it to say, that the annals of modern river engineering afford analagous examples, and the working of the law upon which the result rests may be observed in nature every day, and in many places upon our own streams.

I am of the opinion, therefore, that stone dams of this character can be put upon the sand foundations in the lower portions of and at the mouths of the cañons of the Yuba and Bear Rivers with perfect safety.

Dams for storing detritus, and other stone dams.

I remark the difference in principle upon which we should proceed in laying the stone dams here contemplated, from that followed in placing stone foundations for other purposes.

In the case of the proposed rubble dams, we expect percolation through them, and only guard against the washing out of the material below by covering it in with other material, the nature or arrangement of which will not admit of the washing.

We have water highly charged with silt, which it is expected will deposit its load in the dam as the sands are rolled against it. We are not constructing to hold clear water, or to bear a heavy load.

In stone foundations for a bridge or a masonry dam, the work itself is intended to be impermeable and immovable from the commencement; the largest stones may be placed at the bottom, and it is not intended that they should move.

In the case of the proposed rubble dams, although they must be placed on good sand and gravel foundations, and not on quicksand or "slickens," settlements which will be utterly destructive to works of the other class, would not be a serious circumstance; indeed they are to be expected, and the dam's crest must be brought up to grade as well as raised, perhaps, to accomplish more storage each year.

Stone, the proper material for the future; brush, for the present.

And, in view of the fact that all dams to be used in storing this material should be as permanent as possible, I think the great mass of it in the future should be stored above stone works.

But, considering what has preceded in this paper, I am clearly of the opinion that the work should be commenced with brush structures, and possibly this brush work can be used in other ways so as greatly to cheapen the stone structures, as hereafter suggested.

THE BRUSH DAMS PROPOSED.

Concerning brush dams there is not so much to say. The illustration heretofore cited of a driftrow of brush lodged in a current, affords the idea of the simplest form of such a work, and the natural growth of brushwood and small timber over the sand flats in Yuba River and Bear River presents another excellent example of a pervious brush dam, which causes a deposit commencing below it, by breaking up the lines of the current, and thus destroying its capacity to transport its load of solid matter.

Natural brush dams.

One cannot long study the action of this growth in the localities mentioned, without being thoroughly convinced of the efficiency of the brush dams which nature thus rears in the way of the floods with their charges of sand.

It has only to be seen for the fact to be appreciated, that but a small proportion of the solid matter is carried through such an obstruction, and that it would only be necessary to close the channels intervening between the great growths of young trees, by similar obstructions, to cause an almost complete intercepting of the detritus.

Thus, were the sand-covered flats of the Yuba and Bear Rivers flanked by high plains or levees, they might be made to retain the sediment to be brought down for a number of years to come, by simply causing the sands to rest upon them on greater grades, by placing low permeable brush dams at short intervals of space in the way of the currents, and adding to them from year to year.

As it is, however, no such banks exist very far down into the plain; the time has passed when this action could have been availed of to any great extent without artificially confining the waters on the sides, and for this purpose very large levees must be now constructed, although by such means the storage room below the foothills will be increased, yet it is limited, and we must look forward to the time when it will be exhausted. When we can no longer raise the lower portion of the storage ground there will be an overfall necessary at some point—the lowest limit of the deep storage—and for that a pervious brush dam will not suffice.

There must be a firm structure down whose face water may fall, as over a stone dam, without washing out any of the material in or under it.

Impervious brush dams.

Of gravel and brush or small trees, such a dam can be readily built to a moderate height.

The main structure, in order that it may be firmly held to the sand and gravel, must be built with the tops of the trees up stream with their branches covered in and incorporated with gravel or coarse sand, by which arrangement also the butt ends are placed down stream and form the overfall face and crest of the dam.

A heavy apron, immediately below the overfall, should be constructed in similar manner; while to prevent the undercutting action from below, a lower apron must be provided with the brushy ends of the trees down stream.

We would thus have a dam as immovable as a drift tree which lodges upon a sand bank and forever forms a snag, unless removed by human agency.

Stability of brush dams.

If we consider the width to which the waters of the streams now under discussion are spread at the points where it is proposed to construct brush dams, we will realize how they will be robbed of their destructive force by being led to encounter an obstacle such as a dam in the face of the entire front of their flow.

For instance, the extreme flood discharge of the Yuba River is about fifty thousand cubic feet per second, and its ordinary flood discharge does not exceed half that amount, while its usual discharge through the Winter and Spring is about five thousand cubic feet per second.

I take the larger figure to illustrate the case: At the De Guerre dam site, the shortest proposed line of construction for a brush dam, the overfall will be about five thousand feet in length. Fifty thousand cubic feet of water per second, running at a speed of ten feet per second, will pass over a crest five thousand feet long in a sheet one foot deep, or running at the rate of five feet per second, it would pass over the five thousand foot crest two feet in depth.

In actual practice it would run at a rate according to its velocity of approach to the dam, which would make it from 1.3 to 1.7 feet deep over it.

With a stick to brace himself, a man could almost wade across the Yuba River on the crest of such a dam at the time of its greatest discharge, and could certainly do so at time of ordinary flood, provided the dam was so placed and constructed that the water approached it with nearly equal velocity at all points.

Now, a sheet of water a foot and a half deep, moving at the rate of seven feet per second, represents about the maximum moving force we have to contend against, and under such circumstances it will not be a difficult task to construct brush aprons below the dam, and so guard them as to insure against undermining.

We have examples of brush dams of comparatively slight construction in California which have long withstood the action of water running over them to an equal, if not a greater depth.

Governing the deposit of detritus.

There can be no doubt but that the gravel, sand, and much of the finer sediment brought down by these rivers can be deposited almost wherever it is desired to place them within the territory now covered by the sediments, and held there permanently by brush work only, to a height varying from one to twenty feet, in addition to the depth of detritus already in place.

The practical limit to thus disposing of this sand will be found in the leveeing to prevent the overflow of adjacent lands.

Recent river works have shown in a wonderful degree what complete control the engineer may have over the currents and their sediments, if he only study his subjects closely and seize upon local advantages.

We all know that a lattice fence forms a complete wind-break. Sands blown up from the beach are arrested and made to pile up in great dunes or ridges parallel to the water front by the construction of light wicker work or brush fences.

Works of this kind are numerous in older countries, and the experiment was successfully carried on for several seasons under my direction at the seaward end of Golden Gate Park in San Francisco.

Similar constructions which do not present enough resistance to the currents of water to be swept away or undermined by them are now used to gradually check their velocity and to force them to drop their sands—like those blown by the winds from the beach—where the engineer desires to have them rest.

Within the last two years, upon the Missouri River, near Omaha, a greater advance has been made in this class of work than was previously chronicled to my knowledge.

I here quote from a popular account of these operations, recently published in the *Scientific American*, deferring more extended notice of the official report spoken of, and the details of works, until I submit to you a special report on the improvement of the larger streams in your district.

Experience on the Missouri River.

Speaking of the Missouri River, the journal, after describing the action of the stream at certain points, says:

"To keep the river within regular bounds the yielding banks have to be protected, the velocity of the current diminished in certain places, and the channel held in place by building up or solidifying its sides. The different means employed in this sort of work are described by Captain Hanbury of the Engineer Corps, in a recent report upon the condition of the Missouri River, near Omaha. For causing deposits to take place, and for deflecting the currents in localities that are to be built out, floating brush obstructions have been applied with marked success. The most successful of these is the floating brush dike, made by taking saplings from twenty to thirty feet long, and from four to six or eight inches in diameter, and nailing or fastening to them with wire, scraggy brush of any kind obtainable in the locality. This forms what is known as the 'weed.' Instead of the saplings rope may be used to hold the brush. To one end of this 'weed' is attached an anchor of sufficient weight to hold it in position against the current; to the other a buoy to hold up the down stream end and prevent it from going to the bottom under the pressure of the current against it. These 'weeds' are placed from ten to twenty feet apart, thus forming the floating dike. Their action is to check the current gradually, without producing that scouring effect to which the solid dike gives rise. This done, a portion of the material which is rolling along the bottom or being carried down in suspension is deposited, and causes a rise in the bed of the river, which changes its channel to the direction desired. The rapidity with which these deposits take place is truly wonderful. One season is often sufficient to raise the river bed up to the limits of ordinary high water.

"Another form of obstruction that has been tried with success is the willow curtain. This, as its name indicates, is made of willows about an inch in diameter or larger, fastened parallel with each other, and from six to eight inches apart, by means of wire. The curtains can be made of any desired width and length. They are anchored in position by weights attached at intervals along the lower edge, and held in an upright or inclined position in the water by floats made fast to the upper edge. Their action is similar to that of the 'weeds.'

"Another form that has been experimented with, and which bids fair to give good results, is a screen made totally of wire, something after the fashion of a seine. It is anchored and buoyed like the willow curtain. The rootlets and small vegetable fibers that float in large quantities in the water accumulate upon the wires, and form obstructions sufficient to check the velocity of the current."

Application of the above experience.

Here we find remarkably favorable results produced in a deep and rapid river, by methods the most economical and safe in their application. It only requires an intelligent study of our circumstances here to apply some one of these contrivances successfully in each case.

For instance, I do not doubt that the Yuba River, now coursing down the line of the north levee, for about three miles of its length, transporting a great volume of sediment past it daily, can be made to deposit this load where it now threatens erosion, by the use of some such means as the brush curtain applied on the Missouri River. Thus, by checking the current at short intervals by these screens, we would build up a levee strong enough to resist all attacks of the floods—for there is no reason why it should not be a thousand feet through on the base, all deposited by the water itself up to the height of the flood line.

These screens are really open work brush dams, and act as has been described before of such works.

There are circumstances, then, under which pervious brush dams may be used to advantage on the Yuba and Bear Rivers, but to store the great mass of sands that are to come down these rivers, even during the first few years of this work, more substantial structures will be required of brush and gravel, and in the future the great mass of detritus must be held by rock dams between the foothills as before described; unless, indeed, it is proposed to let these sands spread over large areas of land as yet uninjured.

And here I remark that the application of this idea of causing the waters to deposit their burden of detritus by opposing at short intervals permeable obstructions to their flow, is almost illimitable.

By the use of heavy brush curtains trailing in the waters, and swung from shore to shore in the wider parts of the river cañons by means of cables, it would be possible to arrest the great mass of sands between a series of low rock brush rapids, and thus fill up the whole cañon for a number of miles in length at once, without the use of any heavy dams at all.

The cost of the work would probably be excessive, however, and the plan is only mentioned to show to what extent the possibilities in this matter reach. It is evident that sediment-bearing waters may be made to deposit their load under any ordinary circumstances; but it is also clear that if the waters are to continue to run over the deposit, some more stable obstructions must be introduced to prevent subsequent erosion. Hence the introduction of the rock and brush riffles spoken of above.

Our work not an experiment in the popular sense.

It is well in this connection, also, to allude to one more point. It has been said that this work is altogether experimental. This assertion is not correct.

Nothing is more certain than that the flow of these sands can be arrested before they reach the main rivers; the engineering principles upon which we are to work are well understood, and their operation proven.

But, under the particular circumstances which we have, there is a question as to how the object can be most cheaply accomplished.

To this extent the work is experimental, and if carried forward intelligently it cannot but result in showing, after the first year or two of trial, wherein economies may be practiced and the object attained at less cost, as all river works have before it.

SPECIFICATIONS FOR BRUSH WORKS.

On this day I hand you specifications for brush dams on the Yuba and Bear Rivers.

They are drawn for heavy dams, intended to become rapidly impermeable as the muddy water flows over them, and upon the principle heretofore laid down. In my opinion, it will be necessary to put such structures, at least, across all open channels where the force of the current at flood time is to be resisted, and it is intended to cause a deposit for the full width of the stream; in other words to store the detritus above the dam.

Where the line of a dam is located through a heavy growth of brushwood, or young timber, the character of the structure may be changed so as to effect a material saving in construction.

A belt of such timber left standing forms a dam for our purposes itself, and taken as the framework of a permeable dam, this kind of a structure might be put up through such a belt at a very moderate cost, in line with the heavier dams across the open channels.

I do not attempt to draw specifications for this class of work at this time. Indeed, so much will depend upon the exact character of the growth itself, that it will be necessary to examine each line in detail before any such attempt can be made to advantage.

When the lines of the proposed dams can be gone over after the water has fallen somewhat more, I will, if desired, make specifications as are required.

Difficulty of describing river works in detail before construction.

Here let me call attention to the difficulty of drawing a description of such works sufficiently in detail upon which to contract.

The best laid plans for this class of river works have almost always to be changed to suit the peculiar circumstances and conditions found or developed during the course of operations.

Frequently it may cost near as much to make the examinations necessary upon which to base specifications for such works as it would cost to do the work itself under management, where there was latitude for the exercise of discretion on the part of the engineer in charge.

And I desire to be understood now as saying that much must be left to the judgment of the engineer in charge, who, as the work progresses, should fit its details to the conditions presented.

For this reason it would be much better if this work could be done by day labor, and not under contract; though it is possible that the objections to this arrangement from other causes would more than counterbalance the advantages presented upon the score just spoken of. And yet I cannot see how the thousand and one little jobs of work, which I may with truth call *stitches in time*, that will have to be carried forward by your Engineer, can be done by contract. It will cost as much to advertise some of them as it will to do them.

Very respectfully, your obedient servant,

WM. HAM. HALL,
State Engineer.

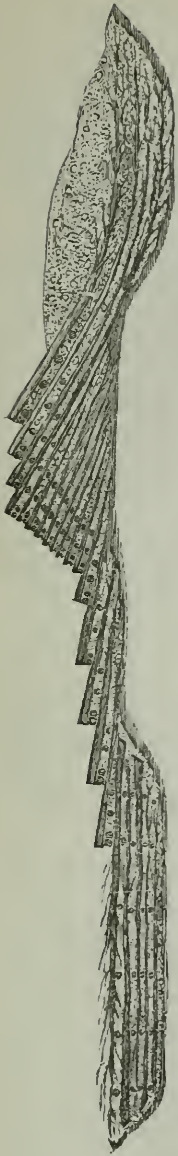
From the foregoing reports it will be observed that in consonance with the law under which we are acting, the sole object of our endeavors is directed to promoting drainage, and while some of the operations may, to a secondary extent, produce results apparently at variance with this theory, yet, in every instance, the primary object has been, and is, to expend the funds intrusted to our management, in such manner only as will further the end in view, viz.: to so improve the regimen of the main artery, the Sacramento River, that it may safely, and with certainty, conduct the waters of its tributaries to the great outlet which nature has provided. As a sequence of this result, the navigation of the Sacramento will doubtless be improved, the lands adjacent to the stream will gain protection, the debris from the mines will be arrested, and many minor advantages gained, but they are all secondary, and dependent upon the one primary object.

It will also be observed that two general classes of works are recommended, the first being preventive, and having for its object the restraining and impounding the sands of the tributaries, and thus preventing their entrance into the navigable waters of the main streams ; the second, remedial, and intended to improve the channels of the streams as flood-carrying and navigable channels. In pursuance of the first of these objects, and for the purpose of arresting the flow of detritus from the mines, we have caused to be constructed permeable brush dams across the Yuba and Bear Rivers.

That upon the Yuba is located, approximately, seven and one-half miles above Marysville, is nine thousand six hundred feet in length, and has an average height of seven feet.

That upon Bear River is located at Johnson's Old Crossing, about three miles above Wheatland, is six thousand feet in length, and has an average height of six (6) feet.

The following specifications will serve to illustrate the mode of construction of those dams, it being premised that the one on the Yuba is located at what is designated as Site Number Two (2), and not at the point first proposed, and that the specifications were somewhat modified, both before the work began and during its progress. For an account of these modifications, and the reason therefor, we refer to the report of the State Engineer, which will be submitted to you.



SPECIFICATIONS

FOR A BRUSH DAM ON THE YUBA RIVER, DRAWN FOR PROPOSED LINES FOR DAM NUMBER ONE.

DAM EIGHT FEET HIGH.

Cross section of dam, exclusive of backing .... 400 square feet.

EXCAVATION—

Pit at heel of dam	64
Pit at toe of dam	130
	194

Solid contents of the timber and brush in the dam, 70 per cent.	10.37 cu. yds. (2.19 cords) per 1 foot of dam.
Ballast in dam, 30 per cent.	4.44 cu. yds. per 1 ft. of dam.
Gravel backing	2.00 cu. yds. per 1 ft. of dam.
Excavation	7.19 cu. yds. per 1 ft. of dam.

TREES REQUIRED PER ONE FOOT OF DAM.

1.35 trees, 8 inches in diameter, 33 feet long.
1.35 trees, 8 inches in diameter, 34 feet long.
1.35 trees, 8 inches in diameter, 35 feet long.
1.35 trees, 8 inches in diameter, 36 feet long.
3.60 trees, 6 inches in diameter, 17 feet long.
3.60 trees, 6 inches in diameter, 16 feet long.
3.60 trees, 6 inches in diameter, 15 feet long.
3.60 trees, 6 inches in diameter, 14 feet long.
4.32 trees, 7½ inches in diameter, 17 feet long.
1.44 trees, 7½ inches in diameter, 20 feet long.
1.44 trees, 7½ inches in diameter, 23 feet long.
1.54 trees, 7 inches in diameter, 33 feet long.
1.54 trees, 7 inches in diameter, 30 feet long.
1.54 trees, 7 inches in diameter, 28 feet long.
1.54 trees, 7 inches in diameter, 26 feet long.
1.54 trees, 7 inches in diameter, 24 feet long.

34.70

SITE AND CHARACTER OF THE DAM.

1. The site of the proposed dam is on the Yuba River, 9.28 miles in a direct course above the county bridge, across that stream at Marysville, and in a line immediately across the general direction of the river from the long rocky point which puts out from the north highland shore into the sand and gravel covered bottoms, now occupied by the waters as a flood channel.

2. The alignment of the work designated "site of the proposed dam No. 1," as determined upon preliminarily, is shown on the detail map of Yuba River, to be seen in the office of the State Engineer, or the office of the Board of Directors of the Drainage District in the State Capitol building, and the position of this line is marked at each end on the ground by a redwood stake, 6x6 inches square, to which is attached a small pole and flag; the post being marked with the brand of the State Engineer Department (S. E. D., 1.).

3. In the direct course the distance across the high-water river bed between these posts is about 4,800 feet. The sands of the high-water channel occupy about 4,600 feet of this distance, and vary but little from a level plane in their profile along this line, except at several points where channels three to five feet in depth are cut down. At their low stage the waters run in these channels, or one of them, to a depth of one to two feet. The bottom of these channels are of gravel, and the intervening plane, composed of sand and gravel, is at points covered by a slight growth of timber and brushwood. The northern end of the line is on a bold rocky point; the southern end on a sloping earth bank.

4. It is proposed to construct on the site thus described a dam of brushwood and gravel, to a height of eight feet above the average elevation of the ground's surface, and it is presumed that this dam will range in height from four to twelve above the foundation.

5. Accompanying these specifications will be found a tracing sheet marked, "Plans for the proposed brush dams," exhibiting cross-sectional drawings, with dimensions and quantities of materials (as estimated) in the proposed dam for elevations ranging from six to ten feet, inclusive.

6. From these drawings it will be seen that the structure will consist, in general terms, of close crib-work, composed of small trees with the branches and bushy tops for the most part left on, the spaces between the trees and branches being closely packed with gravel and small brushwood. And further, that the upper toe of the structure is heeled in below the surface of the ground with its top on a level therewith, while the main part, which forms the dam proper, rests upon the natural surface adjusted to a level plane.

LONGITUDINAL DISPOSITION OF THE DAM.

7. This dam is to be constructed so that its crest, as represented by the upper edges or corners of all the three butts which end at the top surface throughout the width thereof (up and down stream) and for at least 4,000 feet uninterruptedly of its length, on completion and final acceptance of the work, shall be within four tenths of a foot of one level plane. So that allowances made for settlement must be agreed to by the contractor before and during construction, as the exact circumstances of foundation and character of material are ascertained; and the work must be so done, at the contractor's risk, that the condition, as to elevation of crest, will be present on final completion as aforesaid.

8. On completion and acceptance, also, the down-stream edge of the dam's crest must be in such alignment that it will nowhere depart more than one foot from the straight line forming its ends, and the over-fall face must be on a uniform slope of about forty-five degrees, as shown in the drawings.

9. Each way from the level portion (the position of which will be designated by the resident engineer on commencement of the work) the dam's crest must rise towards the ends thereof on slopes of from two in one hundred to six in one hundred, as may be determined upon by the resident engineer, preserving a level-topped cross section, and ending at an elevation of six (6) feet above the plane of the level portion.

10. According to the shape of the ground surface and character of the material found along the line, the foundation of this structure is to be laid in level benches in depths below the general surface of the adjacent portions of the stream-bed, approximating closely to those shown on the diagram of cross-sections. The exact grade of each bench or division will be determined by the resident engineer before or during the work of construction, when the character of the material and shape of the surface becomes known. Each two adjacent benches in the foundation are to be connected by a slope not in excess of one on ten in degree of inclination, and no bench shall be less than one hundred feet in length, exclusive of any such slope.

CROSS-SECTIONAL DISPOSITION OF THE DAM.

11. When finally completed and accepted as a whole, the crest (as before defined) of this dam shall nowhere vary more than four tenths of a foot from a level plane in any line across it. The trees on the up-stream face of the dam must lie in a plane sloping within five degrees of the inclination which corresponds with a slope of one on two (1 on 2), and its down-stream face (as made up by the butts of the trees in the body of the dam) must lie in a plane sloping within five degrees of that corresponding to a slope of one on one (45°).

12. The plane of the lower apron (as shown by the red line in the cross-sectional drawings) in each longitudinal bench-division of the work must be within two tenths of a foot of the

grade set for it, which will be even with the average elevation, as at first found, of the ground's surface adjacent to its lower edge.

FOUNDATION OF THE DAM.

13. Upon making a profile survey and drawing of the site of the dam, the resident engineer will lay out the work in divisions, each of which shall be at least one hundred feet in length, and subsequently the foundation is to be laid down in each of such divisions as a whole, or in subdivisions not less than one hundred nor more than two hundred feet in length, as may be deemed best by the engineer.

EXCAVATION.

14. For at least half of such division or subdivision, as the case may be, the excavation is to be made complete to the determined sub-grade before the laying of the brush is commenced within the same.

15. The work of excavation may be carried on by any method to suit the contractor's convenience. Spare material must not be left in a continuous ridge below the apron, but such ridge, if made in the process of excavation, must be broken through at one hundred feet intervals, and free escape ways must be provided for the water on a level with the top of the adjacent portion of the apron for at least half of every subdivision of the work.

16. The depth and width of the excavations for a dam of each sized section probable are shown on the diagrams heretofore referred to, and these dimensions are to be closely adhered to in each instance, on the average throughout each division of the work, except as provided in next paragraph.

17. In cases where the material found in excavation is not such as, in the opinion of the engineer in-charge, it is desirable to build on, the contractor will be required to continue excavation, if necessary so to do, to as much as twice the depth originally designated on the profile and diagrams of cross-sections, and build the structure thereon at the contract rates for the work; *provided,* that no excavation shall ever exceed six feet in depth on the average for any one hundred feet of foundation.

18. It being understood that only in case of such material as soft slime or "slickens," and quick-sand being encountered or other substances which would render the foundation unsafe in the opinion of the engineer in charge, are the excavations to be made deeper than those originally set out on the profile when the grades are first established.

19. In case materials of such consistency that the foundation pits cannot be maintained after excavation are encountered, then, in the discretion of the engineer in charge, the excavations may proceed in smaller subdivisions at a time than those heretofore designated, which shall be immediately filled with brush and gravel to such an extent and in such manner as the engineer in charge may direct.

20. In general, the sub-grade of the structure, being the ground surface upon which the structure is to rest, is to be disposed as shown in the cross sectional drawings, and the longitudinal profile hereafter to be made as aforesaid.

THE STRUCTURE.

21. Upon the ground surface thus shaped and prepared, the structure is to be built in the following manner:

22. The lower apron laid entirely beneath the average plane of the ground's surface, is to be first built in each division or subdivision of the work.

23. It is to be composed of small trees, varying from twenty-five to thirty feet in length in the averaged sized structure (and of greater or less length, as shown in the drawings for the larger and smaller cross sections), and four to eight inches in thickness of butt, laid close together lengthways up and down stream, in horizontal layers, separated by smaller poles placed at right angles to the direction of the trees in the layers, the whole to be consolidated and filled in with small brush loaded and incorporated with gravel to the extent of thirty per cent. in bulk of the structure.

24. The poles of each set are to be spiked solidly down upon the tree trunks below, and the trees of each layer are to be solidly spiked down to the poles upon which they rest. Tree nails of hard wood may be used in this fastening, or iron spikes of sufficient length to take at least two and a half inch hold may be used.

25. The upper apron, laid partially below and partially above the natural surface of the ground, is to be next built, in each division or subdivision of the work. As shown in the sectional drawings, this apron rests partly on the lower apron and partly on the ground, up stream from it.

26. It is to be composed of the same class of materials as the lower apron, and laid in the following manner: Small trees or trunks of trees, varying from fifteen to twenty-five feet in length in the average sized structure (and of greater or less length, as shown in the drawings for larger and smaller sections), and six to nine inches thickness of butt—are to be laid close together lengthways up and down stream, in layers sloping downwards and retreating up stream, the butts exposed on the down stream edge of each layer, covered or buried at the up stream edge, and for the greater portion of their length. Alternating with these layers of trees, poles of smaller diameter are to be laid, crossing the trees at right angles. The spaces are to be

filled in with small brush loaded and incorporated with gravel to the extent of thirty per cent. of the bulk of the structure.

27. The poles of each set are to be solidly spiked down upon the tree trunks below, and the trees of each layer are to be solidly spiked down to the poles upon which they rest. Tree nails of hard wood may be used in this fastening, or iron spikes of sufficient length to take at least a four inch hold may be used.

THE DAM PROPER.

28. The dam, resting partially upon the up stream edge of the upper apron, partially upon the ground's surface next above, and partially in a pit at the upper edge, is to be next built in each division or subdivision of the work.

29. Its composition and the arrangement of its parts is similar to that of the upper apron. Small trees or trunks of trees fourteen to eighteen feet in length and six to nine inches in diameter of butt, are to be laid close together lengthways up and down stream, in layers sloping downwards, in an up-stream direction, the butts exposed on the down-stream edge of each layer. Alternating with these layers of trees, poles of smaller diameter are to be laid crossing the trees at right angles. The spaces in the layers and between the layers are to be filled in with small brush, loaded and incorporated with gravel to the extent of thirty per cent. of the bulk of the structure. In this manner the dam is to be built up to the intended elevation of its crest; and then trees of larger diameter and thirty to forty feet in length are to be used, as shown in the sectional drawings, with their butts in rows forming the top surface of the dam, their trunks sloping downwards up-stream, on an angle of about one below two, and their tops buried in a pit and incorporated with gravel and brush as in other cases provided.

30. The dimensions of materials in the dam are given for the average sized structures (that eight feet high); larger trees are to be used where the dam is higher, and smaller may be used where it is lower.

GRAVEL BACKING.

31. On the up-stream face of the dam, and on the toe thereof, a bank of gravel is to be placed, as shown in the drawings, in amounts in the different divisions of the work varying with the height of the structure, as follows:

On a 4 foot dam, 1.00 cubic yards of gravel per linear foot.
On a 6 foot dam, 1.50 cubic yards of gravel per linear foot.
On a 8 foot dam, 2.00 cubic yards of gravel per linear foot.
On a 10 foot dam, 2.50 cubic yards of gravel per linear foot.
On a 12 foot dam, 3.00 cubic yards of gravel per linear foot.

STONE BACKING.

32. In the discretion of the Board of Directors a rough stone backing may be substituted for the gravel backing; this point to be determined after opening the bids for the work.

33. In case such stone backing is adopted, then it shall be placed as is the gravel backing, or as directed by the engineer in charge, and the amount of stone used will be about two thirds of those designated for the different heights of dam for a backing of gravel. Special figures in the bids for gravel and for stone will be required, as hereafter provided.

THE ENDS OF THE DAM.

34. At the northern end this dam is to be set in a bench cut in the rock point from which it there springs, in such manner as may be designated by the engineer in charge; *provided,* that the excavation necessary shall not exceed 600 cubic yards in amount.

35. The end of the dam itself is to be thoroughly covered and protected with rough stone, as may be directed by the engineer in charge; *provided,* that the amount of stone necessary shall not exceed 1,200 cubic yards. The character and size of stone shall be same as that for backing, as before specified.

36. The southern end of the dam is to be similarly covered in and protected, and connected with the face of the hill or slope against which it will rest, and the same provisions are to apply.

37. And all concerning this end finish and protection of the dam is'to be considered with the proviso that the Board of Directors may adopt whatever method or plans of work they may consider best under the circumstances, and may, for as much as 1,000 feet in length, at the southern end of the work, substitute or append an earthen embankment or levee, protected on the upper face by a rip-rap covering of rough stone, in pieces not less than one cubic foot in length.

END TRAINING WALL.

38. At the southern end of the overfall of the dam, a training wall, built as a groyne to the dam and in a similar manner to the dam itself, is to be carried out from the lower face of the dam to a distance of one hundred feet and returned, parallel to the dam, to the hard bank land, to a distance not exceeding four hundred feet, and this shall form a finish to the apron at that end, and beyond it no apron need be constructed.

39. The connection between the groyne and the dam is to be made as the engineer in charge may direct, as are all connections and finish in detail of the parts.

MISCELLANEOUS PROVISIONS.

40. In the construction of this dam, it will be necessary to turn the waters of the stream from their low-water channel in order to construct therein; and this work is to be done by the contractor at his own risk and expense, without compensation other than provided for in payment for the main work.

41. The brush and trees necessary for the construction of this dam are to be cut off the sand-covered flats adjacent to its site, and the Directors guarantee to the contractor the right to cut and remove the same without compensation for damages or payment for the material; *provided*, that in such cutting and transportation, the contractor constructs all necessary roads and causeways, and openings in fences, etc., and exercises due diligence and care to avoid unnecessary damage; *and further provided*, that the Directors will not be responsible for any damage occasioned by reason of the escape of stock, or the inroads of stock upon crops or pastures which may be occasioned by the openings in fences, made by the contractor, or in any way by the occupation of premises by him.

42. The brush cutting shall be conducted under the direction of the engineer in charge, and in no case shall all of the brush be stripped from the land below the site of the dam; but belts thereof, at least fifty feet in width, shall be left at five hundred feet intervals, and extending across the general direction of the stream so far as it grows.

43. The rock necessary in the construction of this dam shall be quarried half on the north side of the stream from the down stream face of the point against which the dam is to rest, at such point as the engineer in charge may direct, and half on the southern shore of the river, in the rocky point just above the dam site.

44. The Directors guarantee the contractor the right to quarry and remove this rock without compensation for material, or damages under the same provision as heretofore enumerated in the matter of cutting and removing brushwood for the dam.

45. The Directors guarantee to the contractor the right of way for the transportation of all material on such routes as may be reasonably practicable, and on conditions as respects liability for damages, similar to those already inserted in the section concerning brush cutting.

46. All brush cut and all rock quarried in the prosecution of this work, and remaining unused at its completion or forfeiture of contract, is to revert to the Board of Directors, and the contractor is not to lay claim, after the work is done, to any peculiar privileges of right of way, or right to material of any kind other than his plant of tools and appliances which may be removed from the premises.

47. Whenever the word *gravel* is used in these specifications, it is to be taken as meaning the best material of the kind to be found along the line of the structure, or within 500 feet thereof; it shall not contain more than 30 per cent. of sand, and must pass inspection of the engineer in charge.

LAYING OUT AND MEASUREMENT OF WORK.

48. This work is to be staked out by the resident engineer, under the direction of the State Engineer, and is to be carried forward to the satisfaction of the engineers and the Board of Directors of the district.

49. Measurements for works of certain dimensions are given on the exhibits and schedule hereunto appended, and made a part of these specifications as hereafter enumerated. Payment is to be made on such measurements for the standard sizes shown, and for intermediate sizes payment will be made upon dimensions of cross sections proportioned to the height of the dam above the ground line in each case.

50. All extra work of any class, except excavations to depths below the limit heretofore specified (six feet), is to be done at contract prices upon the measurement thereof.

51. Measurement of work is to be agreed to by the contractor and resident engineer upon each division thereof before it is laid in.

52. Work is only to be accepted and approved and taken off the contractor's hands upon the final completion of the entire structure.

53. In case of any undue settling of any part of the dam after the completion of that part, the integrity of the work is to be preserved in such manner as the State Engineer may specify and the Board of Directors may direct, and consequent differences between the contractor and the Board of Directors are to be made by the Directors and in their discretion.

54. The work is to be prosecuted from its two ends simultaneously, and with all due diligence and dispatch, and brought forward in the manner and order directed by the engineer in charge.

AMENDMENTS TO FOREGOING SPECIFICATIONS,

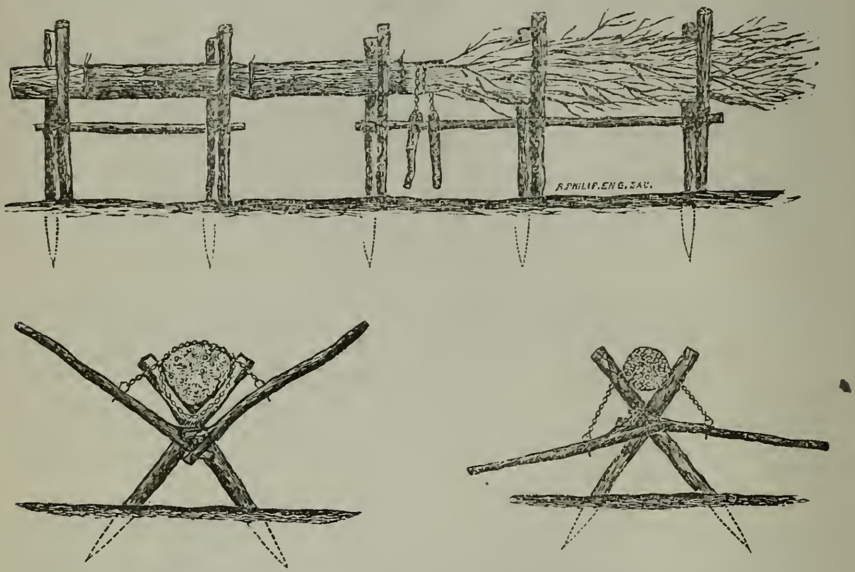
Prepared at request of the Board of Directors, District No. 1, July 6, 1880.

55. The foregoing specifications are to govern the construction of the contemplated dam, except, in case trees of proper size cannot be secured in sufficient number for the purpose within 2,000 feet of site of the work, when, after close examination, the Board of Directors may curtail the dimension of the dam in cross section.

56. And again, should the supply of small trees—as called for in the specifications—to be found within 2,000 feet of the work prove to be insufficient to complete the structure to the dimensions finally determined upon by the Board of Directors, the contractor may substitute bundles or fascines of smaller trees or brush saplings, made and laid under the direction of the engineer in charge.

57. The fascines are to be made where the brush is cut, in lengths proper to substitute for the small trees called for in the specifications; are to be made in presses, as shown in a cut accompanying these specifications, or in some way insuring equally good manufacture; and are to be firmly bound, at four-foot intervals, with No. 16 (Birmingham gauge) iron wire.

FASCINE CONSTRUCTION.



58. These fascines are to be substituted for the trees where designated by the engineer in charge, are to be pegged down and together firmly, and treated in all respects as are the trees in the structure; *provided*, that the top course at the upper edge, and that at the lower edge of the dam's crest, and the course at the foot of the overfall shall be composed entirely of trees of the dimensions and otherwise as at first specified.

BIDS FOR THE WORK.

59. The work to be executed in completing this structure is classified as follows: 1—Excavation for foundation; 2—Brush and timber ballasted; 3—Gravel backing; 4—Stone backing; 5—Stone weighting and protection of ends of the dam; 6—Earthwork embankment or levee at south end of the dam.

60. *Excavation.*—Includes removal and disposal of all material to be handled in preparing a formation for the dam and the auxiliary works.

61. *Brush and timber, ballasted*—Includes the cutting and transportation of brush and timber, the excavation and transportation of gravel for ballast, the laying of these materials, and completion of the structure composed of them as before specified.

62. *Gravel backing*—Includes the excavation, transportation, and depositing of this material as heretofore outlined.

63. *Stone backing*—Includes the stripping and opening of quarries, excavation, transportation, and laying of stone according to specifications and directions.

64. *Stone weighting and protection*—Includes work as provided above under head of "Stone backing."

65. *Earthwork embankments*—Includes the construction of an earthwork levee not over 1,200 feet long at south end of dam, containing about five cubic yards of material per linear foot. The work to be done with scrapers and as directed by the engineer in charge.

Bids are desired for this work as follows:

66. *For the excavation:* Per cubic yard, measured in the pit.

67. *For the brush and timber ballasted:* Per cubic yard, measured in the work (predetermined allowances for settlement not counted in.)

68. *For gravel backing:* Per cubic yard, measured in place on completion.
69. *For stone backing:* Per cubic yard, measured in place on completion.
70. *Stone weighting and protection:* Per cubic yard, measured in place on completion.
71. *Earthwork embankment:* Per cubic yard, measured on completion (predetermined allowances for settlement not counted.)

SPECIFICATIONS FOR THE DAM AT SITE NO. 2, ON THE YUBA RIVER.

These specifications, so far as the composition and construction of the dam are concerned, are substantially the same as those for the dam at site No. 1.

The points of difference are shown in the following synopsis of specifications for the dam at site No. 2.

1. The proposed dam site No. 2 is two (2) miles below site No. 1.

2. The line is marked on the ground similarly to line No. 1, and on the map is shown as "Line of proposed dam No. 2."

3. In the direct course the distance across the high-water channels and intervening flats of the river is about 9,600 feet, and consequently the dam proper will be about this length.

Paragraphs 4 to 31, inclusive, are the same as in specifications for dam at site No. 1.

Paragraphs 32 to 36, inclusive, are omitted.

37. *End finish:* The ends of the dam are to be raised gradually, so that water will not run over its crest within at least 100 feet of the ends proper, and these are to be joined with the natural bank, or with earthwork embankments.

Paragraphs 38 and 39 are the same, with the exception that there must be a training wall at both ends of the dam, at site No. 2.

Paragraphs 40 to 58, inclusive, are the same.

Paragraph 59, leave out "stone backing," and "stone weighting," and change numbering to suit.

Paragraphs 60 to 62, inclusive, the same.

Paragraphs 63 and 64 to be omitted.

Paragraphs 65 to 68, inclusive, the same.

Paragraphs 69 and 70, inclusive, to be omitted.

Paragraph 71, the same.

SPECIFICATIONS FOR A DAM OF BRUSHWOOD AND GRAVEL ON BEAR RIVER.

These specifications are in all respects similar to those for the dam at proposed site at No. 2, on Yuba River, with the exception that the site is described as being on a line directly across the river from a point 200 feet, more or less, above the head of the levee on the north side of what was formerly known as Johnson's Crossing, and the probable length of the dam is about 6,000 feet.

The contracts for the erection of the dams were awarded on August 10th, the one on the Yuba River to Messrs. Rideout & Binney, of Marysville, and that upon Bear River to Messrs. Doane & McBean, of San Francisco.

The cost of the works was somewhat enhanced by the fact that the contractors were, by the terms of their contracts, required to complete the structures within sixty days, the fear of approaching storms precluding greater delay. A variety of causes combined to prevent the completion of either structure within contract time, but fortunately the work was finished before storms intervened.

It is too soon, however, to speak in the light of mature experience of the effects to be produced by these dams. State Engineer Hall, who has made their construction and availability a subject of patient and persistent study, is sanguine as to the results to be experienced, and his theories have the approval of such eminent engineers as Colonel G. H. Mendell, United States Engineer, and Captain James B. Eads, both gentlemen of world-wide celebrity in their profession, and who have, in their capacity as Consulting Engineers, given this work special attention.

Thus far the dams promise all that can be hoped for. They check the flow of water and rid it of the heavier portion of its sand, which has already accumulated to a considerable depth just above the structures, and the water thus relieved of its surcharged material, is permitted to flow on with its scouring capacity greatly increased.

LEVEE WORK.

The work of constructing levees to confine the waters of the Feather, Yuba, Bear, and Sacramento Rivers within their respective channels, with a view to increase the scouring capacity of those streams during flood periods, has been steadily pushed forward on as large a scale as the funds at command would warrant.

The following table will show the amount and the purposes for which money has been expended:

State Engineer Department—Payroll	$12,262 00
State Engineer Department—Expenses	5,158 87
District Engineer Department—Payroll	7,841 41
District Engineer Department—Expenses	4,086 66
Assessors and Auditors of counties, in District	8,965 99
Advertising	1,025 50
Legal expenses, brush, &c.	863 50
Salaries of Directors and Secretary	2,286 64
Office expenses	50 00
Printing, specifications, stationery, etc.	326 65
Paid for work (per contract)	320,321 18
Total	$363,188 40

We have commenced suits for condemnation of land to be used for storage of debris above the dams, and material of which said dams are constructed, as provided for in section eleven of the Act to promote drainage, and said suits are now in process of litigation.

CONCLUSION.

Difficult as has been the labor entered upon by the Directors, they feel warranted by experience in declaring that during the progress of their operations they have seen much to encourage the hope of ultimate success. Obstacles that seemed insurmountable, have either disappeared or proven less formidable than was supposed. Many who, at the outset, doubted the feasibility of controlling the large volume of mining debris constantly being sent down from the mountain gulches, of restoring the regimen of the rivers, and teaching those rivers to excavate their own channels, better informed, are yielding to the belief that, by an intelligent and systematic treatment of the whole problem, our navigable waters may be saved to commerce, the industries of the farmer and miner brought into such relations that each may prosper without material injury to the other, and the general welfare be promoted at an expense commensurate with the object to be obtained.

W. H. PARKS,
W. F. KNOX,
NILES SEARLS,
Board of Directors of Drainage District No. 1.

Attest: CHARLES M. COGLAN, Secretary.

UNIVERSITY OF CALIFORNIA.

COLLEGE OF AGRICULTURE.

REPORT

OF THE

PROFESSOR IN CHARGE TO THE BOARD OF REGENTS,

BEING A PART OF THE

REPORT OF THE REGENTS OF THE UNIVERSITY.

1880.

REPORT.

To President John Le Conte, University of California:

I have the honor to transmit herewith my report of the operations of the Agricultural Department of the University during the year 1880. In view of the nature of the investigations now constituting so large a part of its province, an annual report, issued as soon as possible after the end of the growing season, seems to be the most appropriate form for communicating the results to the agricultural public.

INSTRUCTION.

In the matter of instruction, no material change has occurred since my last report was made. Mr. Charles H. Dwinelle, whose entire time is now given to the course of Practical Agriculture and the experimental cultures on the University grounds, has been enabled to increase greatly the usefulness of that course by better means of demonstration. At the same time, he has taken upon himself all that part of the correspondence of the department that relates directly to special cultures, and among these more especially that relating to insect pests, and other matters, the consideration of which had become impossible to myself, by reason of a multitude of other duties. As in the previous year, a course of twelve lectures on Dairying has been delivered by Mr. E. J. Wickson, the able editor of the Rural Press. It is a matter of continued regret that this excellent practical course, on one of the most important branches of agricultural industry in California, should not be more numerously attended by persons interested in dairy farming. At the same time, it renders obvious the fact that any additional courses of lectures on the details of particular industries, cannot find a place in the undergraduate course of Agriculture, without detracting too much from the time that must needs be given to the general course. There is thus, for instance, no room for a full course of lectures on Viticulture, such as should be given to those intending to make that culture a specialty; nor for one on the culture of Sugar Crops, or of Cotton, or of a dozen other subjects that should be specially treated of. The difficulty lies altogether in the fact that students are not willing to attend such lectures during a year subsequent to the course of general studies, which must of necessity precede the special courses; and it is hardly to be expected that the latter should be delivered to empty chairs.

The attendance of students upon the properly agricultural courses of instruction has been about the same, there being, however, a manifest tendency to the taking of a partial, or two years' course, embracing only the two last years of the curriculum prescribed as a requisite for graduation. I am not disposed to regret this, under the present circumstances, since it practically implies that such students attend, not for sake of a diploma, but for the sake of learning what will make them better farmers hereafter. The new regulation allowing the admission of "Partial Course Students" without the regular matriculation examination, but under the special care and responsibility of some member of the Faculty in whose department the studies to be pursued chiefly lie, has placed this class of students upon a definite and more satisfactory footing. The knowledge that their continued attendance depends upon their keeping the professor under whose care they are placed, satisfied that they are doing reasonably well at least, tends to prevent that looseness of habits that so often occurs with students outside of the regular courses, when not of sufficient age to need no restraint. But in this connection it should be distinctly understood, that the number of *graduates* will not be a proper test of the actual attendance or past usefulness of the department. So long as the profession of "agricultural expert" is not a recognized and lucrative one, as it is in Europe, so long will there be a tendency to restrict the study of agricultural science to those portions only having the most obvious bearing upon practice.

I think that the time when agricultural experts will be called for, in the same manner as mining experts, is not very far off. The continual and rapid increase of the demands upon this department, for information and advice upon the most varied and difficult problems—of which there is perhaps an unusual number before the California farmer—shows plainly enough the need of professional advice, and therefore of men whose business it would be to give their services in agricultural questions, as experts or superintendents, with a full knowledge of all their bearings, and scientific as well as practical solutions. To qualify such men properly, they should of course acquaint themselves thoroughly with all the points of actual practice. On this necessity I have always strongly insisted—the "practical course" following the course of study, being a recognized part of all technical education, without which the "graduate" remains a mere tyro. I should prefer to make the actual performance of such a practical course, a pre-requisite to the conferring of any diploma whatsoever.

Heretofore, some difficulty has been experienced by students in obtaining permission from the owners of farms on which the best practice could be learned, to take such a course on any other footing than that of a mere laborer, having no choice in the matter of the kind of work to be done. This difficulty, I am pleased to say, bids fair to be obviated in the future, by the consent of such public-spirited and successful farmers as Mr. R. B. Blowers, of Woodland, and Colonel Wm. Hollister, of Santa Barbara, to take such students, upon recommendation of the agricultural professors of the University, for such length of time as might seem desirable, for the purpose of their obtaining a practical knowledge of the special branches pursued, on the respective farms. Three students and one graduate of the University availed themselves of Mr. Blowers' permission, during the past season, to study practically the subject of raisin-making at his establishment, two of them remaining for several weeks. It is to be hoped that a larger number of such opportunities will be offered from year to year, by gentlemen who have been distinguished by their success in special departments of agricultural industry. Even if the long hoped-for experiment stations should be established by the State, or the United States, this chance of learning the practice and conditions upon which *financial* success has been achieved, would remain equally desirable for young men; and since in agricultural pursuits there are but few manufacturers' secrets to be guarded, and competition is not usually feared, there can be little reason for a refusal to grant a permission of this kind, save an unwillingness to answer a few questions. To this extent, however, the farmers who desire their sons to be practically educated, should be willing to put their own shoulders to the wheel.

AGRICULTURAL COLLECTIONS AND EXHIBITS.

In view of the annually recurring, and well grounded desire that the Agricultural Department of the University should contribute to the instructive exhibitions at the larger fairs of the State, and the difficulty of accomplishing this without great labor and not inconsiderable expense when these collections have to be re-arranged every year and for every occasion, I have deemed it best to provide a set of portable glazed cases, 3 by 4 feet, for the permanent accommodation of a set of such specimens. These cases can be readily packed and shipped in crates, without injury to either themselves or the specimens, and at the same time can be conveniently arranged on the walls of the lecture room for permanent exhibition and instruction.

It thus becomes practicable, at a small expense, to convey to prominent points in the State an ocular demonstration of the kind of work that is being done in this department of the University, and thus to create an interest not only in that work and its practical results, but also in the University as such, as a center for the higher and technical education. The exhibits made this year at the Mechanics' Fair, San Francisco, at the Golden Gate District Fair at Oakland, and at the State Fair at Sacramento, have attracted a good deal of attention and favorable comment; especially with regard to the collection of cereals, largely grown from a collection of a few ears each, imported from Germany last year, as heretofore stated. A comparison of these cereals as grown in California, with the original ears imported, which are placed side by side in the agricultural lecture room, is both intrinsically interesting, and flattering to the quality of California soil.

A list of the cereal varieties grown on the grounds during the past season, forms Appendix No. 4 of the present report.

The collection of soils, increased during this year by the specimens collected under my direction by Mr. N. J. Willson along the routes of the C. P. R. R. (as elsewhere mentioned), now numbers between 650 and 700, representing a large proportion of the agricultural lands of the State. For the greater part of this valuable collection there is at present no accommodation save an improvised table in the lecture room, and in this condition is not only unsightly, but also scarcely available for study. All the cases are filled, and there is not wall room for more. So far as the latter is concerned, relief would be afforded when the room now occupied by the library, but originally intended for the Department of Agriculture, shall become vacant. But it must not be forgotten that in order to render the more ample space thus secured available, a not inconsiderable expense must be incurred in the matter of fitting up that room with appropriate cases and shelves, and in occupying the adjoining room for office and laboratory purposes, if such arrangement be approved. The expense involved in this most desirable change would amount to about $1,500.

There is, moreover, pressing need of special clerical assistance in labeling and arranging specimens, preparing lists and catalogues, preparing diagrams for lecture purposes, etc.; all of which could be done by one person in the space of about two months.

WORK ON THE AGRICULTURAL GROUNDS.

The agricultural grounds have been, during the past season, about three fourths occupied by experimental plots, under the direct supervision of Mr. W. G. Klee. The nature of the experiments made, as well as their results, are set forth in the report of Prof. Dwinelle, who has charge of this work; forming Appendix No. 3 to the present report. These results are important and interesting in many ways; not the least so in exhibiting the surprisingly favorable effect of Summer fallow and thorough tillage upon the grain-production of the very refractory soil. After breaking up to the depth of twelve inches, and plowing-in of several crops of weeds, spots having apparently no soil at all, but only yellow subsoil clay, have had their yield increased from a maximum of 23 bushels of wheat in 1879, to as much as 46⅔ bushels per acre in 1880. As this soil is representative of a very large area on the slopes of the Coast Range, this result is of no small practical importance. Manifestly, our grain-growers have only just skimmed the surface, leaving the greatest store of plant food deeper down, and ready to become available to more careful and thorough culture.

The manure experiments, as well as those with drilled against broadcast grain, have also yielded important results.

Among the most interesting, however, has been the experimental culture of a large number of new varieties of grain, imported from Europe last year, in the form of a collection of ears, each specimen consisting of four. Of these, one or two of each was sown in small plots, which formed quite a striking feature of the grounds when maturing. From the heads so produced, greatly exceeding in beauty the original samples, sowings will again be made next season, so as to keep up the assortment, and obtain enough for the distribution of the more promising ones, for trial in various portions of the State.

Of a number of rare grain varieties grown during the previous season, enough was harvested this year to allow of the distribution of amounts varying from 20 to 50 pounds, among farmers desirous of testing the same, and under promise of a faithful report of results. The latter condition will be strictly adhered to in cases of distribution of seeds or plants, so that the experience had may be promptly recorded and published for the general benefit.

Besides the rarer varieties of grain, about 2,900 pounds of ordinary grain has been harvested from general experiments, and sold at current rates. Moreover, 15 tons of hay have been produced, forming more than an ample supply for the teams.

While, however, a slight return for outlay has thus been secured, it has become more than ever apparent how impossible it is to combine valid experimenting with profitable culture. The care required in planting, harvesting, winnowing, weighing, taking of samples, etc., to prevent mistakes, intermixtures, false references and the like, is a very costly item, and places the harvest returns out of all proportion with the expense incurred in securing them. It should be distinctly understood that experiment stations, as such, cannot be lucrative or self-sustaining, unless expressly so arranged that the profits arising from one portion of the land, cultivated for profit, may sensibly cover the excess of expense incurred in experiments on the other portion. In other words, if a farm yields an annual income of $3,000, that sum may be devoted to defraying the expenses of experiments; but the latter themselves must, as a whole, be placed on the debit side of the account.

I cannot omit to state, that we are as yet far from having a proper equipment for experimental purposes, in the way of farm implements; the heavy expense of labor having restricted the outlay for additional implements to very narrow bounds, in order to remain within the limits of the appropriation made for the agricultural department. We are sadly in need of more labor-saving implements. Again, some of the best portions of the grounds, as to soil, are rendered almost unavailable for purposes of comparative experiment, by the lack of drainage. We need about 3,500 feet of underdrains, which the lack of funds has thus far placed beyond our reach. Should this become possible, we would desire to test, side by side, the relative cost and efficacy of tile drains (such as are now manufactured at Napa City for agricultural purposes, at a very moderate cost) and drains made on the "asbestine" system of sub-irrigation, out of hydraulic cement laid by appropriate machinery.

With the field experiments should be combined a system of analyses of the different grains, etc., as well as of the same grains produced under different circumstances. But the constant calls made upon the time of the one chemical assistant in the agricultural laboratory, for the determination of questions of immediate importance, place any such systematic examination beyond our reach at the present time. Some tests made of sorghum, grown on the grounds, will be found under their appropriate head.

GARDEN OF ECONOMIC PLANTS.

The garden of economic plants has continued under the direct charge of Mr. W. G. Klee, to whose intelligent and efficient management I must here bear testimony. The general arrangement has remained the same as heretofore reported, while a large number of economically useful or otherwise interesting plants has been added to the collection, by way of purchase, exchange, and donation. A list of such acquisitions is annexed to the report of Mr. Klee on some of the more interesting results of the culture of plants new to California, which forms Appendix No. 5 of the present report.

A more complete system of labeling has been carried out, so as to render the interesting points more easily understood by students and other visitors, whose increasing number attests the increasing interest in this feature of the University grounds. The propagating houses and grounds having, of late, also been transferred to the charge of my department, the same general plan is being carried into effect there, so as to render them subservient, in the main, to the purposes of instruction and experiment, with such plants as require, either wholly or partially, the protection of the cold or hot house. With our present means and accommodations, we cannot, and in my opinion should not, attempt to compete with florists in general floral display; but our aim should be to show, as far as possible, a large assortment of useful and ornamental plants, each kind being represented by only a few specimens. This is perfectly compatible with an ornamental and tasteful arrangement; yet, while the latter point should always be kept in view, it is not intended to make it a primary object; the educational and instructional aspects being unquestionably entitled to first consideration. Under this same point of view, I think it very desirable that the system of labeling trees, shrubs, and other plants, so as to convey information to visitors, should be carried out to a reasonable extent, and uniformly, in all portions of the University campus.

A list of donations of seeds and plants received since the last report was made, forms Appendix No. 6 of this report.

That our indoor accommodation for tender plants is even now wholly inadequate to our needs, and causes a frequent loss of valuable stock, while standing in the way of a desirable increase of such plants, I have stated in previous reports. A large plant house, in which a fair and well arranged collection of important tropical plants could be installed, would form not only a great attraction, but also a highly useful feature of the University grounds. May we not hope that some of our wealthy citizens will, before long, bestow upon the University this much needed gift?

AGRICULTURAL SURVEY OF THE STATE.

In this important branch of the work of my department, considerable progress has been made during the year, so that I hope to be able to construct, within the coming year, a reasonably complete map of the main agricultural features of the middle and southern part of the State.

This measure of progress is due essentially to the initiative and aid of the United States Census office. It is well known that under the Act of Congress providing for the taking of the Tenth Census, provision was made for an extension of the work beyond that of a mere enumeration, so as to elicit and collect, not mere numerical statements, but such information regarding the natural resources and industrial pursuits in the several States, as would give a correct idea of their actual condition, progress, and wants, not only to those having the time and patience to scan and interpret for themselves the figures, but to the general public as well.

How effectually and understandingly this programme has been carried out by the able Superintendent of the Census, General Francis A. Walker, is, to a considerable extent, a matter of public note. The best scientific and technical talent of the country has been enlisted in the work; and the publication of the results of all these investigations will mark an epoch in the history of census enumerations, and will form, it is to be hoped, an example to be followed and improved upon hereafter.

Having been requested by Superintendent Walker to take general charge of the subject of "Cotton Production in the United States," in so far as other duties and the great distance from the real field of labor rendered it practicable, I have been enabled to claim for California the share of attention to which her climate and soil, if not her actual production of the great staple, entitle her in this connection. It being an essential feature of the plan to construct, as far as possible, complete agricultural maps of the cotton-producing States, it became necessary to fill up, by field exploration, such portions of the field as had not heretofore been sufficiently investigated. Such work has had to be done in most of the cotton States, and it was especially necessary in the case of California. While the funds at command did not admit of any considerable expenditure in this direction, yet it has enabled me to fill up the most important gaps in my own knowledge of the State, partly by personal exploration, partly by enlisting the services or coöperation of others.

The first step in field exploration was taken by myself, during the October recess of last year, in an excursion to the cotton plantations of Merced County, including also the foothills and adjoining plains of Mariposa, Tuolumne, and Stanislaus Counties. A number of representative soils were collected, and the information so obtained on the subject of cotton culture in the State, formed the basis of the work subsequently carried out.

The second step was taken, at my suggestion, through the courtesy and interest of Mr. B. B. Redding, by Mr. L. M. Clement, head of the track department of the Central Pacific Railroad Company.

It was at first proposed to have samples of the soil of the lands lying along the routes of the railroad, collected through the station agents or section bosses. But on consideration, it was thought that the collection thus made would lack in a measure that authenticity which, in matter of this kind, constitutes its chief value, and that a great deal of labor spent in the investigation of samples perhaps not properly taken, might thus be wasted. It was then determined to detail for the purpose an intelligent young engineer, Mr. N. J. Willson, who should act under my instructions in taking samples, and in furnishing a connected and reliable description of the agricultural features of the regions traversed by the road from Redding, Shasta County, via Lathrop, to Yuma, on the Colorado River.

Under this liberal and efficient arrangement, Mr. Willson traveled during three months of the present year, on a light hand car, which could easily be kept out of the way of trains. The specimens collected by him were forwarded, as he progressed, to the University, largely by the courtesy of Wells, Fargo & Co.'s Express, to whom also our thanks are due for their liberality in free transmission of specimens. The daily record and field notes kept by Mr. Willson during his somewhat arduous and solitary expedition, were by him transcribed from time to time, and forwarded to my office, where they form a somewhat bulky and most valuable source of information concerning the agricultural features of the regions traversed.

Finding, in the examination of the specimens and notes sent by Mr. Willson, that my impressions regarding the upper valley of the San Joaquin were not very correct, I determined to utilize the March recess of the University—of one week—for a personal exploration of the Counties of Kern, Tulare, and Fresno. At the same time I appointed, under the authority of the Census Office, Mr. Herman Partsch, a student of the Agricultural Department of the University, to make an exploration on the seaward side of the Coast Range, of the Counties of Santa Cruz, Monterey, and San Benito. Mr. Partsch's field notes and report of this trip form another volume of valuable record, such as, ultimately, we hope to have for the whole State.

The discussion of the subject of alkali soils and waters, forming Appendix No. 1 of this report, is largely based on data and specimens obtained in these excursions, and subsequently elaborated, so far as the chemical work is concerned, in the agricultural laboratory, by the regular assistant, Mr. Jaffa. Prior to his appointment to that position, however, Mr. Jaffa carried out, under appointment from the Census Office, twelve analyses of representative soils from the region of the State adapted to cotton culture. These soil analyses, as well as their discussion, distribution, adaptations, etc., being the property of the Census Office, cannot at present be reported, but will be embodied in the general agricultural description ot California, forming part of publications of the tenth census, and will probably be in print toward the latter half of the coming year.

The timely and efficient help thus afforded us in the work of obtaining a full and accurate description of the agricultural features of the State, will be of material assistance in making known the resources and agricultural capabilities of California, through the wide publicity that will be given the Government report throughout the world. While it may be a matter of regret that the viticultural interests of the State should not have received a similar consideration on the part of the tenth census (a fact due, not to any unwillingness on the part of the Census Office, but to a want of unity of action on the part of the wine-growing interest of the United States), so as to have included, between the territory occupied by the two industries, the entire length of the State in the examination and description: it is a matter of congratulation that this defect has, in measure, been complemented by the provisions of the Act and appropriations for the benefit of viticulture, passed by the last Legislature. Should this appropriation be maintained during the next two years, it will enable us to complete, to a reasonable degree of accuracy, the agricultural description of the northern part of the State.

It is greatly to be regretted that the systematic investigation of the soils of the State has, during the past year, been almost altogether confined to the analyses made, as above stated, under the authority of the Census Office; the multifarious calls upon the time of the regular assistant having crowded out the more remote subject of soil analysis. I hope that during the coming year, this work may again receive at least a share of his attention.

VITICULTURAL WORK.

The progress made and work done under the Act of the last Legislature, for the promotion of the viticultural industry, is reported in detail in Appendices Nos. 8 and 9 to the present report, to which I respectfully refer.

FINANCIAL NEEDS.

In conclusion, I respectfully suggest, that inasmuch as the work forming the subject of the present report is almost entirely dependent upon the special appropriations made for the purpose by the Legislature, it will become necessary to make application to that body at the coming meeting, for the continuation of the appropriation made during the past three years. I cannot omit to remark, however, that with the constant increase of scope called for in our experimental work, and the pressing demands for investigations of every kind, the sum of $5,000 per annum, heretofore appropriated, will barely enable us to pay more than running expenses, and farther improvement and increase of scope will be impossible. The objects for which additional expenditure is needed are mentioned above; and if they are to be accomplished, the annual appropriation should be increased to at least $6,000 for each of the next two years.

The continuation of the viticultural work on the plan laid down, and carried into effect as far as feasible already, will require for the coming two years an appropriation of $2,000 per annum, or $4,000 altogether. All of which is respectfully submitted.

EUG. W. HILGARD,
Professor of Agriculture and Botany.

APPENDIX No. 1.

ALKALI SOILS AND IRRIGATION WATERS OF THE SAN JOAQUIN VALLEY.

I. ALKALI SOILS.

[NOTE.—The general remarks on alkali soils are partially reprinted from the last biennial report, for obvious reasons.]

This name is applied in California, almost indiscriminately, to all soils containing an unusual amount of soluble mineral soils, whose presence is frequently made apparent by the "efflorescence," or blooming-out on the surface, of a white powder or crust, soluble in water. This "alkali" becomes most apparent in dry weather following upon rains or irrigation. Later in the season it usually becomes less perceptible from intermixture with dust, as well as from the failure of the soil-water to rise near enough to the surface. The first rain, dissolving the salty substances, carries them partly into the watercourses, but chiefly back into the soil, whence they rise again at the recurrence of dry weather.

The immediate source of the "alkali" is usually to be found in the soil-water, which, rising from below and evaporating at the surface, deposits there whatever of dissolved matters it may contain. Such water, when reached by digging, is by no means always perceptibly salty or alkaline; and the same is mostly true of the soil, an inch or two beneath the surface. For since the soil, acting like a wick, draws up the soil-water and allows it to evaporate at the surface, it is *there*, of course, that all the dissolved matters accumulate, until the solution becomes so strong as to injure or kill all useful vegetation. The injury will usually be found to be most severe just at, or near, the crown of the root, where the stem emerges from the soil.

One obvious and practically important conclusion to be drawn from the above considerations, is that the more water evaporates from the surface of the soil within a season, the more alkali salts will be drawn to the surface. Hence, within certain limits, a greater rainfall will bring up a larger amount of alkali; or, if instead of rain, surface irrigation is made to supply an additional amount of water, the same effect will be produced; *always provided*, that the rainfall or irrigation does not go so far as to actually wash a portion of the salts definitively beyond the reach of surface evaporation, into lower strata, from which springs or seepage will carry them into the country drainage.

The measure of the rainfall, or amount of irrigation water, that will accomplish one or the other of these opposite results, depends in a large measure upon the nature of the soil, as well as of the underlying strata. It is more difficult to wash the soluble salts out of a clay soil than out of a sandy one; and the moisture and accompanying salts will keep rising through the former from greater depths, and for a greater length of time after the cessation of rain or irrigation.

Roughly speaking, there is in California an obvious *inverse* relation between the rainfall, and the prevalence of "alkali" in the soils. The concurrent increase of alkali and decrease of rainfall to southward, is most obvious in the Great Valley; but is also observable, more or less, to seaward of the Coast Range. The alkali question is of general importance chiefly in that part of the State lying southward of the City of Sacramento. In the region north of that latitude, the more copious rainfall seems to keep soils leached of their alkali, if, indeed, it is naturally as abundant as in the San Joaquin Valley.

Another conclusion resulting from the principles above mentioned, is that in the practice of irrigation, the nature of the water used is of great importance; since what it contains of soluble salts will be left in the soil by evaporation, helping to swell the mass of alkali year after year, until it may become so great as to render the land unfit for cultivation. Provided, again, that the amount of irrigation-water used is not so great as to sink through into the strata supplying the country drainage, carrying with it its soluble ingredients, also.

RECLAMATION OF ALKALI LANDS.

The most obvious remedy for this evil is, of course, the leaching-out of the injurious salts by flooding, and, if possible, *under*-draining. This method is habitually resorted to in seacoast marshes, near the mouths of rivers, after the salt water has been excluded by embankments.

The limited salty spots so frequently met with in the uplands of some regions, are promptly cured by a few underdrains, through which the winter rains wash the salts definitely beyond the reach of the soil-water. Such spots are very commonly found extraordinarily fertile afterwards.

The problem of affording relief, however, becomes much more difficult when either a stratum of saline water, or an earth-layer containing much saline matter, lies a few feet beneath the surface in a level region—as is, unfortunately, very often the case in California. When this happens the evil can only be mitigated, but scarcely altogether cured. According to the value of the land to be reclaimed, one or several of the following remedies may then be employed:

1. When the "alkali" is not very abundant, or very noxious, *frequent and deep tillage* may afford all the relief needed. For, inasmuch as the damage is in most cases the result of an excessive accumulation *at or near the surface*, it is clear that frequent intermixture of the surface layers with the deeper portions of the soil may so dilute the injurious salts as to render them powerless for harm.

Moreover, since a perfect tilth of the surface greatly diminishes evaporation, it tends to diminish, concurrently, the accumulation of the alkali near the surface. The same effect may be produced by mulching, or by covering the surface with sand.

With the aid of deep tillage, it is often possible to raise on salty seashore lands, root crops, such as beets or carrots, which absorb a large amount of soluble salts, and sensibly relieve the soil; so that cereal crops may be grown the second or third year.

2. *Underdrains* may so far lower the water-table from which the

saline matters are derived, and may so far favor the washing out of the salts during the rainy season, that the latter will thereafter fail to reach the surface so as to accumulate to an injurious extent, with reasonably deep tillage. The roots of plants will go deeper for the requisite moisture, but will not be injured by the weak saline water below.

With the aid of underdrains, in many cases a comparatively small amount of irrigation water may, when applied at the proper time, be made to produce the leaching effect upon the surface soil that would otherwise require a long time and a much larger quantity of water, in order to wash the alkali into the country drainage.

3. When the quantity of the salt or alkali is small, but its nature such as to be nevertheless very injurious or corrosive, the evil may be greatly mitigated, or sometimes completely relieved, by the application to the soil of *chemical antidotes*, cheaply procurable in commerce. In order that the proper antidote may be chosen, it is of course necessary to determine the nature, and in a measure the amount of the "alkali," by chemical analysis.

The salts usually found in the California "alkali" soils, so far as they have come under my observation, are of three kinds.

a. Neutral alkaline salts, such as common salt, Glauber's salt, sulphate of potassium, etc. These are injurious only when present in large quantities, and relief can then be obtained only by washing them out of the soil—by flooding, underdraining, etc.

b. Soluble earthy and metallic sulphates and chlorides, such as Epsom salt, bittern, chloride of calcium, alum, copperas, etc. The cheap and efficient antidote to these substances is LIME; in some cases, even a natural calcareous marl will answer the purpose.

c. Alkaline carbonates and borates. These, especially the former, are injurious in the smallest amounts, rendering the soil-water caustic and corrosive, and in clayey soils rendering it almost impossible to obtain good tilth, by their peculiar action upon the clay.*

They are most abundant in southern California, while the second and first class seem to prevail in the Sacramento Valley. The antidote to these, the *true* alkali salts, is *gypsum* or land plaster.

The efficacy of these antidotes depends, of course, upon *the presence of water, without which they cannot act on the "alkali."* They should be sown or spread on the surface, and plowed or harrowed in, to a moderate depth, just prior to irrigation, where that is used; in the case of plaster, put in with the grain; in that of lime, it should be put in just before a rain, or irrigation, and *not* at the same time with the grain or other seed.

The amounts to be used of either of these substances will, of course, depend altogether upon the quantity of alkali in the soil, and upon the amount of surface evaporation allowed in cultivation. It therefore varies, and must be ascertained by experiment or analysis, in each individual case. Their effect is to convert the corrosive or otherwise injurious salts into "neutral" ones, such as Glauber's salt or common salt, which are from ten to twenty times less injurious than, *e. g.*, the carbonate of soda. It follows that when soils are very highly charged with the latter substance, even its conversion into neutral salts may not suffice to render the soil capable of profitable culture. To effect this it may be necessary to aid the antidote by leaching-out, in bad cases. On the other hand, the antidote will in *any* case adapted to its use, aid either of the other methods of obtaining relief.

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* See report for 1879, page 34.

The farmer afflicted with alkali should therefore not feel discouraged, or disposed to condemn as useless, any *one* of the measures of relief here described, simply because the result is not perfect. The three should be combined whenever possible, to the extent justified by the pecuniary value of the land.

EFFECTS OF IRRIGATION.

During the past two or three years complaints of the increase of alkali on irrigated lands in the upper part of the San Joaquin Valley, especially in the Counties of Kern, Tulare, and Fresno, south of King's River, have become more and more frequent. During a personal examination of that region in March of the present year, this important matter was brought prominently to my notice by many farmers. Much difference of opinion prevailed as to the causes of the evil, but there was no question as to the fact of the increased "rise of the alkali."

The latter phrase, commonly used in this connection, really contains the clue to the whole problem. It is emphatically true that *the alkali salts rise from below*, through the agency of the water evaporating upon the surface. Irrigation has not only increased the amount of water evaporating from the surface, but it has also caused a much greater depth of subsoil to be drawn upon for its alkali.

That in many cases the strata lying at depths of from four to six feet from the surface are much more highly charged with soluble salts than the surface soil, is painfully apparent from the aspect of the material thrown out in digging the irrigation ditches, and now lining the banks of the latter. In some portions of the "island" embraced between the several outlets of Kern River, south of Bakersfield, these embankments appear as though covered with snow; and the "alkali" can be bodily picked up by the handful. It would seem as though the rains would have leached these earth-piles long ago; but the rains usually falling in that region are so light that the soluble salts are only washed into the soil to a few inches from the surface, and within a few days after evaporation has again brought them back in the shape of a white crust.

In digging wells in the light sandy soils of the "plains," from King's River southward, it has often been found that no perceptible moisture existed, even at the depth of from twenty to forty feet, until after the region had been irrigated here and there for several years. The amount of water needed is at first very large, but when the soil is once filled down to the drainage level, one half and even one third of the water previously used will suffice to grow a grain crop.

The annual rainfall in this region is usually so small (four to eight inches) as to suffice only for moistening the soil to the depth of a few feet; and during the time required for the evaporation of this natural moisture, the short-lived vegetation of the region rapidly passes through its development. That vegetation consists of a comparatively small number of species of bright spring flowers, which in their season cover the entire country with a dense and beautiful carpet; one and the same flower occupying the ground almost exclusively at times, for many square miles, by virtue of the law of the "survival of the fittest." Were there any crop of a habit similar to these flowers, that could be profitably grown on these plains, irrigation could obviously be dispensed with.

The settlers of the region have tried what seems to be the next best thing, viz.: to grow grain crops of a short period of growth, and therefore needing irrigation only during a small portion of the dry season. In so doing they have moistened the soil to a considerably greater depth than was reached by the rain water before, and as a consequence, the annual evaporation has greatly increased. The irrigation water, moreover, has brought with it, from these depths, all the supply of alkali salts that before had gradually been washed beyond the reach of the ordinary rainfall, by an occasional wet season. Each succeeding irrigation, followed by evaporation, tends to accumulate the salts nearer the surface, so that finally the root-crowns of the grain crops are "burnt up" before even beginning to head.

The evil will, of course, be greatly aggravated, if the water used for irrigation originally contains any considerable amount of alkaline salts, which are superadded to those already in the soil strata. Some important practical bearings of this point will be discussed farther on.

REMEDIES FOR THE "RISE OF THE ALKALI."

It is obvious that the "rise of the alkali," following upon irrigation, cannot be remedied by the use of the chemical antidotes alluded to above. While they do convert the most injurious salts, carbonate of soda and sulphate of magnesia, into much less active compounds, yet these will remain in the soil, and if in sufficient quantity, will ultimately become noxious to shallow-rooted vegetation especially. In some districts afflicted, the natural alkali consists only of such "neutral" salts as common and Glauber's salt; as for instance, in a part of the rich Mussel Slough country, around Hanford, Tulare County, where, at the time of my visit, dead spots were appearing in the magnificent grain fields, at the time when the grain was but a few inches high; the evil being worst wherever the crop was late, and had not yet shaded the ground. Moreover, it was obviously and strikingly worst wherever the soil was sufficiently clayey to form a hard crust on the surface—a fact well known and recognized by farmers in the alkali regions, but often ascribed simply to the constriction of the stems by the contracting crust. The effect of the latter may, it is true, be noticed in adobe districts, where there is no alkali, and undoubtedly bears its share in doing damage; but the injury it creates is doubly great in alkaline soils.

In the early stages of the growth of cereals, the pulverization of this crust may be accomplished by harrowing or rolling, with great benefit to the crop. But in the upper Valley, it can rarely be done after the last irrigation, without considerable mechanical injury.

That a soil having such a surface crust, dries much more rapidly than the same soil when kept in good tilth, is a fact too well known to require discussion. The dense crust absorbs water much more powerfully than does the loose soil beneath. The moisture is forcibly drawn from the latter into the surface crust, and there evaporates quickly under the influence of air and sunshine, hardening the crust more and more, and accumulating therein an increasing amount of alkali.

To illustrate this, imagine a sponge, representing the loose soil, to be saturated with water, and a hard burnt brick, representing the crust, to be laid upon it; the brick will take all the water from the sponge. Yet, if the brick be soaked in water, and the sponge pressed on it, the sponge will not take up a particle of moisture.

It is thus obvious, that in alkaline soils, the formation of a surface crust must of all things be avoided. In other words, as stated above, page 13, "deep and frequent tillage" is one of the foremost needs in such soils. And as this condition cannot be fulfilled in the case of broadcast crops, the conclusion is that broadcasting, and with it practically grain growing, must ultimately be abandoned in the alkali regions, and hoed crops substituted, which will admit of the ground being kept in perfect tilth throughout the season.

Crops for Alkali Soils.

The condition of preventing evaporation from the surface is also measurably fulfilled by such crops as *alfalfa*, which not only thoroughly shades the ground, but in addition causes almost the entire evaporation water to pass up through its deep roots to the leaves, so as not to reach the surface at all. Such accumulation of alkali in and around the roots, as can occur under such circumstances, is too much diluted to hurt the plant. The fact that alfalfa succeeds perfectly on ground too much charged with alkali to grow grain, is notorious; only care must be taken to prevent injury to the root-crowns while the plants do not yet cover the surface, by timely irrigation. If circumstances permitted the profitable cultivation of alfalfa on so large a scale, the alkali districts would perhaps have little cause to seek farther.

The experience with alfalfa, however, clearly points the way for the selection of crops better suited to the circumstances than grain, whose shallow roots are much more liable to alkali corrosion than is the case with the taprooted, or other deep-rooted plants. It is among these, then, that the alkali regions should seek for crops, of which the product shall be sufficiently valuable to bear the expense of inland transportation, under which these districts are now suffering. Next to these, the search should be for such as will be successful in alkali lands, provided the soil be kept well tilled through the dry season, *i. e.*, "hoed" crops.

In the former category, one of those standing foremost in promise is probably *cotton*, the success of which in that region is already shown by experiments made, the profitable production being at present limited only by the demand for the staple on this coast, which may soon be increased by the establishment of cotton factories. Of other textile crops, *hemp, jute*, and *ramie* at once suggest themselves for trial.

Of *oil crops*, the *castor bean* is perhaps the most available and most certain of success, always excepting the despised "white mustard," or "*wild turnip*," whose rank growth as a weed shows what might be done with it if grown for the manufacture of *rapeseed* oil.

Root crops, being too bulky for profitable shipment by rail, will not be available to any great extent at present, unless as dairy feed, in conjunction with alfalfa, for conversion into butter and cheese. But *beets, carrots, turnips, sweet potatoes*, etc., all fulfill to a greater or less extent, the conditions above formulated, for successful culture in alkali soils.

The culture of *fruits*, both large and small, that can be shipped in the dried condition, or in the shape of jellies, etc., is also an available industry, scarcely yet touched in the alkali regions. Raisins and prunes, especially, deserve attention, as pretty certain of success.

Among hoed field crops available for that region, *sorghum* and *sugar cane* deserve attention. It is true that, in general, the presence of a large supply of soluble salts in the soil is deemed unfavorable to the profitable production of sugar, since it is apt to render the juice difficult to crystallize, and to increase correspondingly the proportion of molasses produced. Actual trial, however, can alone determine the question here; and the results of some experiments made in this direction during the past season, will be found in another place in the present report.

It would really seem as if in the broadcast culture of cereals, the farmers in the alkali districts had made the worst possible selection for the permanent good of agriculture in their region. That a change of system in this respect is imperative, can hardly be questioned by any candid observer of the facts. And it may well be questioned whether the necessity imposed by nature, of more varied and careful farming than has heretofore obtained, may not prove a blessing in disguise when rightly understood and acted upon. The planting system enriches a few individuals, almost always at the cost of the soil's permanent productiveness. It is small farms and intelligent culture that constitute the prosperity of an agricultural community.

SUB-IRRIGATION VS. SURFACE IRRIGATION.

The injury arising in alkali lands from the formation of a consolidated surface, or crust, subsequent to irrigation by flooding, suggests at once the application of the water in such a manner as to avoid this evil, viz.: by sub-irrigation. To a certain extent the advantage so secured is well understood in the irrigation districts, the water being often applied only by the use of furrows or ditches, which divide the land into narrow bands, and from which the soil is moistened by "soaking sideways" from the ditches. The great multiplication of the latter, and their interference with the operations of culture on the large scale, have generally caused the use of this mode of irrigation to be restricted to small cultures.

Even a cursory inspection of the state of things in the alkali regions shows that, in the plots sub-irrigated by ditches, the rise of the alkali has, as a rule, been very much less than in the case of adjoining ones irrigated by flooding; and, in the latter, the high spots that have not been covered with water frequently escape damage, while the low portions are scorched with the alkali. This, at least, is the result when the amount of alkali present is not very great. When the soil is very heavily charged, the high spots, being the first to dry, are, also, the first to be injured by the alkali drawn to the surface by evaporation; while in the low spots the grain may reach a greater development before being killed.

Manifestly, the object to be attained is to prevent the irrigation water from reaching and evaporating from the surface at all, if possible.

To accomplish this fully, it would be necessary to know how far upward water will rise when applied to the several soils. Some data concerning this point are given in books on agricultural science, but they are not of such a character as to permit the prediction of this measure with respect to any other given soil. We know in general that in coarse, sandy soils, water rises rapidly, but only to a moderate height, stopping there; while in soils composed of fine materials, whether clay or fine silty matter, or both mixed, the rise is slow, continuing for months in some cases, before reaching the highest point, which may, however, be twice or three times as much above the water surface as in the case of sandy soils.

For instance, in coarse, sandy soils, like those of portions of the plains of Tulare, or of parts of Stanislaus, the water may, in the course of three or four days, reach its highest point at twenty inches; while in adobe soils, or in the gray silt soils of Eel or Santa Clara Rivers, it may take ten days to reach the same height, but will continue to rise slowly for several months before reaching the maximum height of about 50 inches.

These points are illustrated by the following table of results, obtained by placing in a vessel containing water, kept at a constant level, wide glass tubes, filled with the different soils, and recording, from hour to hour, at first, then from day to day, the heights reached by the ascending moisture.

No. 1. Coarse, sandy soil, from Morano Station, Stanislaus County. May be considered as representing the more "open" plains soils of Kern and Tulare Counties.

No. 2. Hill adobe soil, from the campus of the University. A very refractory clay soil, described in the Report of the Agricultural College for 1877, page 38.

No. 3. Light sediment soil, from Mr. Blanchard's orange orchard, on the first bench of the Santa Clara River Valley, at Santa Paula, Ventura County. Is remarkable for remaining moist within twenty inches of the surface throughout the season, the water table being at 15 to 20 feet below the surface.*

No. 4. Same as the last, but somewhat compacted by light ramming in the tube, as it would be if left untilled.

With the exception of No. 4, the above soils were in a condition of perfect tilth.

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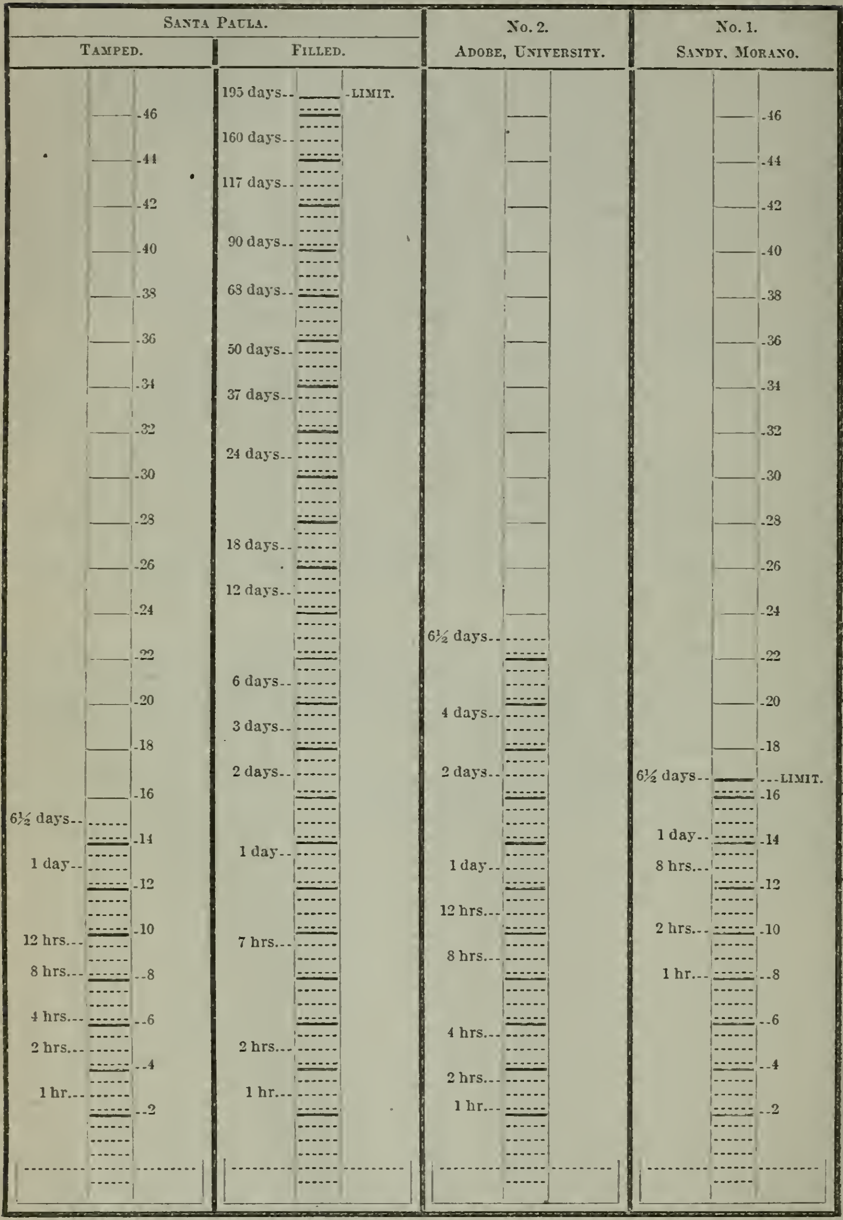
* For mechanical analysis of soils Nos. 2 and 3, see below, page 34.

TABLE

Showing rapidity of ascent of water in different soils, and limit of same.



This table illustrates forcibly some important points in the management, as well as in the natural peculiarities of soils. The coarse sandy soil represents not only its kind, but also any well tilled soil; while on the other hand, the adobe soil illustrates the case of any compact soil, whether naturally so, or rendered so by imperfect tillage, or the prevalence of carbonate of soda. The extreme slowness of the ascent of the water toward the end of its possible rise, shows why a poorly tilled adobe soil will open into gaping cracks a short time after the cessation of rains; while a well tilled soil, maintaining both a quicker supply from below, and a slower rate of surface evaporation, may maintain moisture throughout the dry season. At the same time, it informs us that sandy soils stand in especial need of a more dense subsoil, capable of drawing up moisture from greater depths than it is possible for a sandier mass to do, and thus supplying moisture to the roots of plants, while allowing but little surface evaporation.

The many and somewhat complex bearings of this subject on the chief varieties of soils in the alkali region, will form the subject of farther investigation, now in progress. One point, however, may even now be usefully discussed, viz.: that while it is certain that water applied to a soil like No. 1, at the depth of 24 inches, cannot reach the surface at all, and can therefore evaporate but very slowly, and not in such a manner as to accumulate alkali to an injurious extent near the surface: it does not therefore follow that in order to produce the same result in the adobe or silt soils, the water has to be applied at the maximum depth of 50 inches. For, in a field planted with any growing crop, the leaves of the latter evaporate a very large amount of moisture, thus intercepting that which would otherwise rise to the surface and evaporate there. This is a matter of everyday experience. The inference is, that ditches or pipes designed for sub-irrigation would not in such soils require to be laid to any unreasonable depth, in order to prevent the rise of alkali resulting from surface evaporation.

It is obvious that in this connection, the subject of sub-irrigation by means of a system of pipes, of whatever material, acquires exceptional interest for the alkali districts; since its judicious use would not only obviate the rise of the alkali, but also accomplishes a great saving of irrigation water—the latter being a matter of especial importance where the water itself is somewhat tainted with alkaline salts, as will be shown below. That this system is not likely to be used in connection with the growing of field crops on the large scale, is true, since the expense of the pipes is too great for any land not yielding very high returns. But when the continued rise of the alkali renders lands, intrinsically fertile, incapable of farther production under the system of surface irrigation, the owners will needs have to take their choice between its abandonment, or the adoption of such systems and objects of culture as will yield them profitable returns under the circumstances. The culture of cereals must "go to the wall," and that of grapes, fruits, and such other crops as can be made to yield high returns under intense culture, must take its place.

It is not perhaps unreasonable to hope, that the improperly so-called "asbestine" sub-irrigation pipe (consisting of hydraulic cement pipe that can be cheaply and rapidly laid by a special appliance, at an expense not exceeding, it is said, $35 per acre) may become so generally available by the home manufacture of the material, as to form a practical solution of this great problem. It should not be forgotten that with a slight change in the manner of laying and outletting, this sub-irrigation pipe may be made to serve also for underdrainage; so that land provided with it could be completely leached of its surface alkali by flooding, during the season when water is abundant.

II. LAKE AND RIVER WATERS OF THE GREAT VALLEY,

AND THEIR QUALITY FOR IRRIGATION PURPOSES.

In the above discussion of the "alkali" question, it has been tacitly assumed that the soluble salts already in the soil alone need to be considered, the water used in irrigation being regarded as pure water only. This, however, is far from being actually the case with any natural water, and in the alkali districts, especially, the irrigation water is almost always more or less impregnated with the very same salts whose presence in the soil is so objectionable. It is obvious that when the amount of salts so added annually is at all considerable, it may ultimately so swell the quantity in the soil as to give rise to trouble.

My attention was first directed to this subject by reports from the lands bordering upon Tulare Lake, to the effect that, although to all appearance of the best alluvial character, they would either not produce at all, from the outset, or else would cease to produce after a few years, when irrigated with the water of the lake. The beginning of the investigation of this subject was given in the last report published. (See report for 1878–9, p. 27.) A soil from the southeastern corner of the lake had been analyzed, and found to contain, in abundance, all the elements of fertility, yet it would produce nothing, and that under circumstances which led me to believe that the trouble was caused by alkali (carbonate of soda) contained in the soil. Analyses seemed to confirm this supposition, but at the time the report went to press the water of Tulare Lake itself had not been examined. Water samples were soon afterward received and analyzed, and the result showed it to contain so much alkali of the most corrosive character, as to render it utterly unsuitable for irrigation. It then became apparent that one of the great bodies of water in the State that had been counted upon for irrigation purposes, might have to be altogether rejected. The importance of the question led me to make the matter the subject of special inquiry during a visit to the upper valley, made under the auspices of the United States census, in March of the present year. A personal examination of Kern Lake, and of the region lying between it and Buena Vista Lake, as well as of the Mussel Slough country, of Tulare County, satisfied me that in none of these rich agricultural sections could the slightest increase of alkali be safely risked; and analyses subsequently made of the waters of both Kern and Tulare Lakes, prove that a very few years' use of the water now filling either of these reservoirs, would be promptly fatal to the productiveness of the lands irrigated.

As regards Kern Lake, this is obvious enough from a casual examination and tasting of the water. Having been shut off from the natural influx of Kern River for a number of years, it has been rapidly evaporating and receding from its former shores, so that at the time of my visit a difference in level of over four feet had been produced in fifteen months, leaving high and dry a boat wharf built at that time. About eighteen months before, all the fish and turtles in the lake had suddenly died, creating a pestilential atmosphere by their decay; and even the mussels were mostly dead, a few maintaining a feeble existence. A strong alkaline taste and soapy feeling of the water, fully justified their choice of evils. The tule marsh, laid dry by the recession of the lake, was thickly crusted with alkali, and the tules dead, except where still wetted by the water of the lake, showing that the latter was not yet too strong for such hardy vegetable growth—albeit, fatal to animal life.

Buena Vista Lake was stated to be in a similar condition, but not yet quite so far advanced in evaporation, and still maintaining some animal life in its waters, having lost its connection with the river more recently.

Tulare Lake is well known to be full of fish; and as it annually receives the overflow of Kern, and the regular inflow of King's River, its evaporation and recession has been much slower; yet its water's edge is now distant several miles from the former shore line, and as the water of the rivers is more and more absorbed by irrigation, it will doubtless continue to recede until a point is reached at which the regular seepage from the irrigated lands will balance the evaporation. This epoch would seem, however, to be quite in the future as yet; for the rate of recession has, apparently, not sensibly changed in the last few years. It is not likely, in any case, that the water of the lake will be more abundant, or less impregnated with mineral matter than is now the case, at the time when the state of equilibrium shall have been reached.

In order to assure a fair determination of this important point, water samples from the opposite ends, as well as from the middle of Tulare Lake, have been analyzed, with the results given below.

The sample of Kern Lake water was taken by myself, on the north shore of the lake, March 24, 1880.

Tulare Lake water No. 1 was taken about 300 yards off shore, near the southeast corner of the lake, inside of Root Island, near land lately reclaimed by Mr. E. R. Thomason, of San Francisco.

Samples Nos. 2, 3, and 4 were taken, according to my directions, near the middle of the lake, under orders of the King's River Canal and Irrigation Company, respectively at the surface, at ten feet depth, and at twenty feet depth. Of these, only one (No. 3) was fully analyzed, the total of solid contents only being determined in the case of the others, whose composition could not, of course, differ in any material respect.

No. 5 is water taken by Mr. E. Jacob, of Visalia, at a point off the mouth of Mussel Slough, in the estuary of King's River, March 28, 1880. The sample was taken from the surface at a time when a strong northwest wind prevailed, which of course had a tendency to bring a larger admixture than usual of the fresh water of King's River.

Grains per gallon of—	Total residue.	Carbonate of Soda.	Common, Glauber's Salts, etc.	Carbonate Lime, Magnesia, and Silica.	Vegetable matter.
Kern Lake	211.50	64.37	115.41	9.29	22.43
1. Tulare Lake, south end	84.44	27.92	37.85	13.44	2.28
2. Tulare Lake, middle, surface	81.95	35.30	35.96	5.37	5.32
3. Tulare Lake, middle, ten feet below surface	81.83	30.46	39.49	7.47	4.41
4. Tulare Lake, middle, twenty feet below surface	81.72	----------	----------	----------	----------
5. Tulare Lake, near mouth of King's River	38.55	13.46	15.01	5.11	4.97

To convey to those unaccustomed to the consideration of such matters, an idea of the meaning of the above figures, it may be stated that the solid contents of river waters vary usually from five to twelve grains per gallon. The water of Tulare Lake, where it is undiluted by the inflow of King's River, is therefore about ten times, and that of Kern Lake about twenty-six times, stronger than an average river water.

Even this, however, conveys but an inadequate idea of the relation sustained by these waters to organic life. The average sea water (containing mainly common salt) is about ten times stronger than the water of Kern Lake, as regards its solid contents. Yet in sea water, fresh water fish live freely during part of the season; while in Kern Lake, the fish died at a time when, according to a minimum estimate, the water must have had about twice the present strength of Tulare Lake, or about $\frac{1}{13}$ of the strength of sea water. This shows strikingly the deadliness of the Kern Lake alkali, as compared with sea salt; or in other words, of Kern Lake water as compared with tide water.

In comparing the quality of the alkali of Tulare Lake with that of Kern Lake, we find that in the former, the proportion of the carbonate of soda (being the chiefly injurious ingredient) is about 1 to 2.83 of the whole solid contents, while in the latter this ratio is 1 to 3.28. A part of this difference is, however, due to the large amount of vegetable matter dissolved in the strong lye filling Kern Lake; and when allowance is made for this, the ratio becomes nearly the same in both waters.

As regards the relation between common and Glauber's salt on the one hand, and carbonate of soda on the other, in these several cases, it appears that in the evaporation process there is a gradual relative decrease of the carbonate of soda; for we have for this ratio—

LOCALITY.	Carbonate of Soda.	Common and Glauber's Salt.
Tulare Lake, near mouth of King's River	1	1.11
Tulare Lake, middle	1	1.29
Tulare Lake, south end	1	1.35
Kern Lake	1	1.78

Whether this change in composition arises from a chemical change of the carbonate of soda, or from an actual accession of the other salts, is not easy to determine. The latter is the more probable explanation, inasmuch as actual veins, and strata several inches thick, of what from the description appears to be mainly Glauber's and common salt, have been found in the region between Tulare and Kern Lakes, in digging ditches. But whatever may be the cause of this slight difference in the composition of the alkali in the different portions of Tulare Lake, that difference is not sufficient to invalidate the broad conclusion that the water of that lake, as at present existing, is unfit for any of the ordinary processes of irrigation.

To prove this it is only necessary to consider, what is the amount of the alkali that, under the usual practice, would accumulate near the surface. Ten inches of water is the usual estimate of what is needed in the course of the year to perfect a crop. Now, one gallon of water will cover about one and a half square feet one inch deep, or two thirds of a gallon, one square foot; or, six and two thirds gallons per square foot, is equal to ten inches depth of water. Assuming the average solid contents of Lake Tulare water at 80 grs. per gallon, this quantity upon evaporation will leave near the surface, upon each square foot irrigated, five hundred and thirty-three grains, or about one and one-eighth ounces of alkali. This amount, pulverized and strewn over the surface, would cover the whole of it with white—a phenomenon already but too familiar to the farmers of that region. That the operation could not with impunity be repeated many years on any soil, least of all on such as are already more or less charged with alkali, scarcely requires discussion. To illustrate the latter point, a tule soil, taken by Mr. E. Jacob, of Visalia, from his land near the mouth of Mussel Slough, was leached with water to ascertain the amount of alkali present. This was found to be 0.32, or about one third of one per cent. Of this, supposing it be of the same composition as that found in the water of the lake, about three eighths, or otherwise expressed, one eighth of one per cent. of the whole soil, is carbonate of soda, amounting to *over two ounces in each cubic foot.* This is within the limits of endurance of ordinary vegetation, at least in so fertile a soil; but double or triple it by evaporation, and that limit is passed.

To this conclusion, nevertheless, it is objected by some, that the borders of Tulare Lake are thickly edged with vegetation in many places; and that in some cases, garden plots have been successfully irrigated with the lake water for several years. One such case is reported by Mr. Jacob, of Visalia, who took sample No. 5 of the above table of analyses, from the mouth of a small canal serving for the irrigation of a vegetable garden, which was doing well at the time. A few other similar cases have been mentioned to me.

These, however, do not invalidate at all the conclusion that the lake water cannot serve for general irrigation, as usually practiced. Even the strongest water in the lake, near its southern end, is not so strong as to injure the roots with which it comes in contact, so long as it is not concentrated by evaporation. But in the low tule lands thus far tried, this cannot occur to any great extent, on account of the constant presence of surplus water, and the frequently repeated irrigation, by which the strength of the alkali in the soil is kept below the point of injury. But it would be quite otherwise where the same water, used sparingly two or three times during a season, would evaporate so as to accumulate all its alkali near the surface.

Yet it is probable that if the soil so irrigated were to be leached by a very copious and continued flooding once a year, so as to carry the accumulated alkali into the underground drainage, the water might be used with impunity. This would be especially the case with land underdrained, and could be more readily accomplished the smaller the amount of water originally used. The minimum amount, undoubtedly would be the outcome of pipe sub-irrigation, referred to above, page 21, and would be applicable to the case of orchards, vineyards, etc. It might even be possible, in some cases, to make the same pipe system serve the purpose of irrigation at one time, and that of underdrainage at another. But in whatever way accomplished, a leaching-out of the alkali accumulated from evaporation of such waters, from time to time, would be a necessary condition of their continued use for irrigation purposes.

This principle applies, in fact, to many more cases than is ordinarily supposed. Irrigation, without proper provision for drainage, has in the past, in very many cases, been the cause of the abandonment of lands once abundantly fruitful, which were supposed to be exhausted by culture, but in reality had simply become overcharged with injurious salts, or "alkali," from the ever-repeated evaporation of enormous quantities of water, whose solid contents, though naturally very small, had nevertheless been too strongly concentrated in the soil.

This naturally leads us to the consideration of the river waters of the San Joaquin Valley, and their relation to the origin of the alkaline character of the waters and soils of the upper valley.

GEOLOGICAL HISTORY OF THE VALLEY OF CALIFORNIA.

That the great valley of California was in remote (quaternary) times a great inland lake, which disappeared in consequence of the breaking through, first, of Carquinez Straits, and afterwards, of the passage of the Golden Gate, is a matter scarcely doubted even by the casual observer. A glance at the map also shows that, from some cause not yet fully understood, there exists in the southern part of Fresno County, a ridge across the valley, by which the waters of King's River are thrown southward into Tulare Lake. At present this ridge is intersected, at its western end, by Fresno Slough, through which the surplus waters of Tulare Lake, or of King's River, can find their way into the San Joaquin. But previous to the formation of this outlet, the entire upper valley evidently was a shallow lake, of which Kern, Buena Vista, and Tulare Lakes, are the remnants. From the data given below, it appears certain that the entire lake of the great valley had a somewhat alkaline water; and they also show that probably, the residuary lake of the upper valley was more strongly so at first, and rendered more so in the course of long periods of evaporation, during which "sheets of alkali" (to use the language of the workmen who dug the Kern canal) were formed among the alluvial deposits of the western margin of the valley. It is only thus that the fact already alluded to, viz.: that the *deeper* portions of the Kern Valley alluvium are most strongly impregnated, can find its explanation.

Whence did all this alkali come? A partial answer to this question is readily found in the frequent "blooming out" of soluble salts on the face of hillside cuts. Evidently a good deal of such salty matter preëxists in the geological strata of the valley, and must be continually washed out by percolating water, which carries it into the lower portions of the country, and finally into the lakes themselves. But it would be difficult to account for the large accumulation of these salts in the Kern Valley if there were not some more copious and lasting source. For this we would naturally look to Kern and King's Rivers themselves, and analyses of the waters of these rivers were accordingly made, with the results given below.

To facilitate comparison, the table includes, again, the analyses of the lake waters, already given above, and also analyses of the water found a few feet beneath the surface at Point of Timber, Contra Costa County, near the junction of the San Joaquin and Sacramento. Also, an analysis of the water of the Sacramento River, and of river water from Los Angeles; the two latter made for the State Board of Health by Mr. Walter Jones (of the Class of 1878 University of California), and published in the report of that body for the year 1878:

No. 1. Water taken from the grand cañon of Kern River, in April, 1880.

No. 2. Water from irrigation ditch of the Kern Valley Irrigation Company, taken at a point — miles below Bakersfield. Both the above samples were furnished by the Superintendent of that company. The water at that time was just beginning to receive the melting snows, and was slightly turbid, and of course somewhat diluted as compared to its condition in Winter.

Nos. 3 to 8 have been described above—page 23.

No. 9. Water taken from King's River, at Kingsburg, June 19, 1880, by Mr. J. D. Schuyler, of the State Engineer corps.

The samples furnished of the above river waters were too small—somewhat over a quart—to make a fully detailed analysis of each, as would have been desirable. But the investigation could be carried far enough to determine the chiefly important points, even with the minute quantity of solid residue obtained by the evaporation of these quantities.

No. 10. Water of the Sacramento River, taken from a hydrant in the City of Sacramento, September 19, 1878. In the case of this water, five gallons were evaporated, and the residue analyzed in detail. The data have been recalculated from the published results, so as to conform to the mode of presentation here adopted, which explains the apparent discrepancy of the tables as here given.

No. 11. Water from a well at Point of Timber, Contra Costa County, furnished by Mr. T. W. A. Carter, of that place. This water is found abundantly about eight feet below the surface in that region, and if available for irrigation, could be obtained in unlimited quantities by pumping; but the inhabitants stated that it "would kill the soil."

No. 12. Water from Los Angeles River, taken from a hydrant in the City of Los Angeles, September, 1878.

GRAINS PER GALLON OF—	Total Residue.	Carb. of Soda.	Common Glauber's Salts, etc.	Carb. Lime, Magnesia, Silica.	Vegetable Matter.
Kern River (cañon)	9.49	1.22	1.77	5.55	.95
Kern River (ditch)	9.62	1.23	2.21	5.33	.85
Kern Lake	211.50	64.37	115.41	9.29	22.43
Tulare Lake (south end)	84.44	27.92	37.85	13.44	2.28
Tulare Lake (middle, surface)	81.95	35.30	35.96	5.37	5.32
Tulare Lake (middle, 10 feet below surface)	81.83	30.46	39.49	7.47	4.41
Tulare Lake (middle, 20 feet below surface)	81.72	------	------	------	------
Tulare Lake (near mouth of King's River)	38.55	13.46	15.01	5.11	4.97
Tulare Lake (near outlet of Westside Canal, 10 feet below surface)	76.00	30.95	33.95	6.60	4.50
King's River	4.13	0.003	0.86	3.27	------
Point of Timber (well water)	67.75	10.83	48.41	7.41	1.10
Sacramento River	6.69	0.27	1.42	5.00	------
Los Angeles River	17.53	------	8.37	9.16	------

The following table shows more in detail, the composition of three of the waters given above, in a more general manner:

	Los Angeles City Hydrant, River Water.	Tulare Lake, middle, ten feet below surface.	Sacramento River, City Hydrant.
Carbonate of soda	------	30.46	0.27
Chloride of sodium (common salt)	1.004	20.27	1.42
Sulphate of sodium (Glauber's salts)	4.134	7.54	
Carbonate of lime	0.382	2.49	0.31
Carbonate of magnesia	4.287	4.21	0.25
Silica	1.171	0.69	1.85
Sulphate of lime	0.776	------	0.42
Phosphate of lime	2.182	------	1.48
Iron and manganese carbonates	0.259	------	0.63
Alumina	0.100	0.29	0.07
Vegetable matter	------	4.41	------
Total residue	17.530	81.83	6.69

In discussing the quality of these waters, in reference to irrigation, it must be understood that the group of ingredients mentioned in the fourth column, viz.: carbonates of lime, and magnesia, and silica, are not only useful to vegetation, or unobjectionable, but are also very soon deposited and retained in the soil. We, therefore, leave them out of consideration, so far as the alkali question is concerned. For this, the carbonate of soda and the salts mentioned in the third column, are of chief importance, and among these, the corrosive carbonate of soda is the most noxious by far.

The prominent facts, shown in the above table, may be thus stated: In the water of Kern River, the proportion between the carbonate of soda and the other salts is almost exactly the same as in the water of Tulare Lake, in the proportion of about one to twenty-two. In other words, if twenty-two gallons of Kern River water were boiled down to one gallon, the alkali in this water would, in quantity and quality, be the same as in the water of Tulare Lake; and if this gallon was still further reduced to about three pints and a half, the remaining water would have about the composition of the water of Kern Lake, as it was in March, 1880.

Comparing the water of King's River with that of Kern River, we find that, in the latter, the aggregate amount of solid residue in the water is less than half that found in Kern River. This, however, is doubtless largely due to the season at which the water was taken, it being then greatly diluted with snow water. For purposes of comparison, we should probably double all the figures given for King's River, thus raising the total solid contents of both to nearly the same figure. But even on this basis, we find that the amount of carbonate of soda in the King's River water is utterly insignificant, being not yet one hundredth of a grain per gallon, against about one and a quarter grains per gallon of Kern River water, while, on the same assumption, the percentage of other salts is about the same in both.

It may be advisable to accept this extraordinarily favorable result respecting the water of King's River, with a reservation against a possible error in working on such minute quantities of material. A full analysis of the residue from several gallons of water, taken at a time when the river is not under the influence of the melting snow, will be made as soon as possible. As regards Kern River, the coincident result of the analysis of the two different samples, may be taken as conclusive; and those using its waters should keep in mind, that their evaporation adds annually to the alkali already in the soil, a small but not inappreciable amount, which in some cases may, after a few years, prove "the straw that breaks the camel's back;" and that, therefore, some of the means mentioned above as remedies against this kind of alkali especially, should be currently employed to keep it in abeyance. Tillage after irrigation, the planting of deep-rooted crops instead of grain, and the use of gypsum as a neutralizer of the worst ingredient—the carbonate of soda—are the measures that suggest themselves as the most feasible; while subirrigation, and especially the leaching-out of the alkali from time to time by long continued flooding, and underdrainage, are more radical remedies for future use.

It will be noted that the water of the Sacramento River also contains much less of the injurious ingredients than Kern River, viz.: only about one fifth as much of the carbonate of soda, and not quite as much of the neutral salts.

The water from Point of Timber offers some interesting points, suggestive of a state of things that may have to be taken into consideration in all plans for the irrigation of the west side of the San Joaquin Valley. From its location, this water might have been conjectured to derive its ingredients from tide water percolating into the loose strata. So far from this, its composition is closely analagous to that of the water of Tulare Lake, except that the proportion of carbonate of soda is considerably less; and therefore it is not likely to be as injurious in its effects on vegetation. Yet the inhabitants report here, also, that to irrigate with it "kills the soil," *i. e.*, renders it unproductive. It will doubtless do so when applied in small quantities only, and repeatedly. But it is likely that if used as suggested in the case of the Tulare water (that is, so as to leach the alkali out of the soil once in a season, into the underlying water-table), it might be successfully employed for irrigation, especially if at the same time the carbonate of soda were neutralized by the use of gypsum.

If it be thought too fanciful to suppose, as has been done, that the alkali-water stratum at Point of Timber represents the seaward seepage of Tulare Lake itself, it is nevertheless quite probable that it does represent the quality of the underground drainage of the West Side of the San Joaquin Valley; and is connected with the persistent appearance of "alkali spots" at every low place in the valley, from Antioch up to Kern Lake.

From the facts given above, the importance of a thorough investigation of the quality as well as the quantity of the waters of the great valley of California, with special regard to their effects on irrigated land, becomes sufficiently obvious to need no farther discussion. The facts as nature has made them should be elicited and plainly set before the people, so that money may not be invested in useless undertakings, and damage done which it may be difficult to undo thereafter. With the lights now before us, it can hardly be regretted that the old West Side ditch, which was to irrigate the lower country with the corrosive waters of Tulare Lake, was not successful. The lake level is now several feet below the bottom of that outlet, and the lake keeps receding annually, and its alkali becomes stronger as the mass of the water decreases. It is difficult to say where it will stop; but if, as is probable, a state of equilibrium is reached whenever the waters of Kern and King's River shall have fully filled the parched depths of the plains, by a more general system of irrigation, it is not at all probable that the lake water will thereby become fresher; on the contrary, such seepage water will be likely to bring into it the alkali now dried up in the lower strata, and the annual evaporation will concentrate the solution more and more.

It would certainly be most desirable to utilize the lake as a great reservoir for irrigation supply. But to render this practicable, it would be necessary first to empty out or displace the mass of alkaline water at present occupying the basin. The discussion of the feasibility of such an undertaking, however, belongs to the province of the State Engineer corps.

Referring once more to the above table of analyses, it will be seen that the water of the Los Angeles River, though containing a large aggregate amount of solid ingredients, has none of the carbonate of soda, but only neutral and earthy salts, of which a very large amount only is injurious. This fact, together with the perviousness and free drainage of the lands irrigated, explains why it is that even those which have been longest under cultivation and irrigation in that region, do not show any serious increase of alkali, and may never do so if abundance of water is used, at least from time to time. But as irrigation water becomes more closely utilized and relatively more scarce, the leaching process will occur less frequently, and the accumulation of alkali salts near the surface will become more and more apparent.

There are, probably, but few rivers waters in the world of such composition, or natural purity, that continued irrigation without correlative underdrainage, can be practiced without in the end causing an injurious accumulation of soluble salts in the soil. In India, according to the testimony of Professor Geo. Davidson, the evil effects of such practice have become painfully apparent, and to such an extent that after the expenditure of enormous sums for bringing the water upon the fields, the government now finds itself face to face with the costly problem of its economical removal, by drainage, so as to relieve the soil of the accumulated "alkali," which has rendered it unfit for cultivation. An early attention to this matter, with such foresight as will prevent the occurrence of similar difficulties, cannot be too earnestly recommended to all interested in the irrigated lands of California.

ANALYSES OF ALKALI FROM SOUTH CALIFORNIA.

Six additional analyses of the alkali occurring in localities in the southern part of the State, have been made this year, and are given at the foot of the following table; in which all the analyses heretofore made of the salts impregnating alkali soils in the State, are also reproduced for comparison.

The samples newly analyzed were collected, partly by myself, partly by Mr. N. J. Willson, the latter being those from localities south of Tulare County; to wit:

Goshen, Tulare County.—Soil taken to one inch from surface, after scraping off the white crust; 1 mile east of Goshen depot, S. P. R. R.

Mojave, Los Angeles County.—Alkali incrustation, taken from Mojave desert, between Sand Creek and Lancaster stations, S. P. R. R.

Colton, San Bernardino County.—Alkali soil, taken from railroad track, between Colton and Mound City.

Sumner, Kern County.—Alkali soil, taken from near Sumner depot, S. P. R. R.

People's Ditch, Tulare County.—Soil taken from bank of ditch, 8 miles east of Visalia.

Dos Palmas, San Diego County.—Alkali incrustation, taken midway between Walters' and Dos Palmas stations, S. P. R. R.

It will be noted that in four out of the six localities here represented, the alkali is of the corrosive character imparted to it by the carbonate of soda; and that, therefore, in all reclamation that may be attempted in those regions, the use of gypsum is indicated as an essential aid, in whatever may be done by any of the means indicated above.

ALKALI SOILS.

Chemical Analysis of the Parts Soluble in Water (sol. extract).

Locality.	Soluble salts in 100 soil.	Potassium sulphate.	Potassium carbonate (saleratus).	Potassium chloride.	Sodium sulphate (Glauber's salt).	Sodium carbonate (sal soda).	Sodium chloride (common salt).	Sodium nitrate (saltpetre).
Corvallis, Los Angeles County	1.68	8.74	-----	-----	51.19	-----	22.366	-----
Westminster, Los Angeles County	0.49	20.62	6.59	-----	-----	61.48	10.573	-----
Anaheim, Los Angeles County	-----	-----	-----		-----	-----	Abundance.	Small amount.
Riverside, San Bernardino County	-----	-----	-----	Very small am't.	77.45	0.69	22.17	-----
Merced Bottom, No. 18	-----	-----	-----	-----	Very small am't.	Nearly pure.	Very small am't.	-----
Merced Bottom, No 19	1.00	-----	-----	-----	3.88	63.09	1 21	10.72
San José	14.70	-----	2.92	-----	75.98	14 59	6.79	-----
Benton, Mono County	-----	-----	-----	-----	Considerable.	Abundance.	Good deal.	-----
Sherman Island, Sacramento County	-----	-----	-----	0.19	-----	-----	5.94	-----
Curtis' Ranch, near Stockton	3.73	-----	-----	-----	75.85	6.97	16.38	-----
Overhiser's alkali soil, Stockton	0.15	-----	-----	-----	13 26	52.74	33.08	-----
Overhiser's alkali soil, Stockton	1.02	-----	-----	-----	22.92	64.01	13.064	-----
Hueneme, Ventura County	-----	5.637	-----	0.75 $MgCl_2$	42.50	-----	22.104	-----
Goshen, Tulare County	1.40	-----	-----	-----	44.242	32.98	16.74	-----
Mojave, Los Angeles County	-----	-----	0.58	-----	35.38	12.03	31.48	Silica 0.73
Colton, San Bernardino County	-----	-----	-----	-----	26.73	53.08	12.28	Silica 0.210
People's Ditch, Tulare County	-----	-----	-----	-----	1.22	88.09	1.00	Silica 0.480
Sumner, Kern County	-----	-----	-----	-----	19.20	-----	57.14	-----
Dos Palmas, San Diego County	-----	-----	-----	12.341 $MgCl^2$	29 60	-----	29.44	Silica 2 922

ALKALI SOILS—Continued.

Chemical Analysis of the Parts Soluble in Water (sol. extract).

Locality.	Sodium phosphate.	Calcium phosphate (bone earth).	Calcium sulphate (gypsum).	Magnesium sulphate (Epsom salt).	Organic Salts of—		Total.	Antidote.
					Lime.	Magnesia.		
Corvallis, Los Angeles County		0.51					100.27	Drainage.
Westminster, Los Angeles County							99.262	Gypsum.
Anaheim, Los Angeles County			Good deal.	Small amount.				Drainage.
Riverside, San Bernardino County							100.301	
Merced Bottom, No. 18					Trace.	Considerable.		Gypsum.
Merced Bottom, No. 19	4.10	17.01 org. mat.					100.00	Gypsum.
San José							100.28	Gypsum.
Benton, Mono County								Gypsum.
Sherman Island, Sacramento County				93.17			99.30	Lime.
Curtis' Ranch, near Stockton	1.18						100 378	Gypsum.
Overhiser's alkali soil, Stockton	1.83						100.81	Gypsum.
Overhiser's alkali soil, Stockton	Small amount.						100.00	Gypsum.
Hueneme, Ventura County			2 49	25.61			99 092	Lime, drainage.
Goshen, Tulare County	1.97	1.57 org. mat					100.00	Gypsum, drain'ge.
Mojave, Los Angeles County	0.92	18.88 org. mat.					100.00	Gypsum, drain'ge.
Colton, San Bernardino County	0 60	7.10 org. mat.					100.00	Gypsum, drain'ge.
People's Ditch, Tulare County		9.21					100 00	Gypsum.
Sumner, Kern County		20.87	0.96	18.31			100 00	Drainage, lime.
Dos Palmas, San Diego County			0 772	1.25	23.67		100.00	Lime, drainage.

MECHANICAL ANALYSIS OF SOIL NO. 168, FROM VENTURA COUNTY.

The soil being apparently a representative one in respect to capacity for raising moisture from great depths, while yet of a very light and desirable character in every way, was chosen as one of a number of such representative soils, to be used for the investigation of the relations between the mechanical composition of soils and their ability to supply moisture from various depths by ascent.

I place alongside of the results of this analysis, those previously obtained from a soil in the University campus, of very different qualities:

MECHANICAL ANALYSIS OF SOILS NOS. 3 AND 168.

	No. 3. Per cent.	No. 168. Per cent.
Stones larger than 1.2 MM	13.23	------------
Stones between 1.2, and .6 MM	4.61	3.53
Fine earth	82.16	96.47
Clay	18.92	15.02
Sediment 0.25 hydraulic value	17.25	14.04
Sediment .25 hydraulic value	4.87	1.20
Sediment .50 hydraulic value	6.97	5.14
Sediment 1.00 hydraulic value	6.42	8.03
Sediment 2.00 hydraulic value	6.64	12.67
Sediment 4.00 hydraulic value	3.70	16.36
Sediment 8.00 hydraulic value	7.45	11.48
Sediment 16.00 hydraulic value	11.03	7.01
Sediment 32.00 hydraulic value	9.50	6.45
Sediment 64.00 hydraulic value	3.42	4.11
	100.99	101.51

A comparison of the composition of these soils seems, at first sight, to indicate no very serious difference between the two. But when we subdivide them both into the two classes of components that may be considered, respectively, as representing "heaviness" and "lightness," viz: clay and the two finest sediments for the first, and the remainder for the second, we obtain as the ratio of heavy ingredients for No. 3, 3; for No. 168, 3. Light ingredients, for No. 3, 4½; for No. 168, 7.

But these figures do not yet represent the whole of the advantage of No. 168 over No. 3 as to lightness, which, as I have elsewhere noted, seems to be dependent chiefly upon the middle sediments, from 1 MM. to 8 MM., hydraulic value. These stand nearly in the proportion of 1 to 2, while at the same time, the proportion of clay in No. 3 is considerably larger. The difference as to easy tillage is very great when the two soils are wet; but it will be noted that in the "tilled" condition, the rate of ascent of water in the two (see table, page 20) is not very far apart.

The whole subject of the relation between the mechanical composition of soils, and the rate of ascent of water in them under different conditions as to tilth and compactness, will be made the subject of more detailed investigation during the coming year.

MISCELLANEOUS ANALYSES.

Water from a well near Santa Ana, Los Angeles County; sent by Mrs. Moore, of Santa Ana.

A qualitative analysis showed the residue to consist of sulphates and chlorides of sodium and magnesium, some lime and potash salts, and organic matter. The residue is equal to 5158 grains per gallon, or over eight per cent. solid matter. A salt brine, about two and a half times stronger than sea water, but otherwise of about the same composition. It might be used for salt boiling or brine baths.

Kaolin, or porcelain earth; sent by Mr. J. W. De Golia, Grass Valley, Nevada County, California, March 9, 1880.

Specimen is soft, white, easily powdered, and has a chalky appearance. Its refractoriness was tested before the blowpipe; it remains infusible at high temperatures. Under the microscope, it shows very fine transparent, crystalline particles (felspar), and a portion having the same appearance as the original material.

APPENDIX NO. 2.

ANALYSES OF AGRICULTURAL PRODUCTS.

THE BEET SUGAR INDUSTRY.

The prominent feature of this industry during the past season has been the experiment of beet-drying on the large scale, in Los Angeles County, under the initiative of Mr. E. Th. Gennert. The cold, foggy summer was most unpropitious for the purpose, and the operations having been, unfortunately, undertaken on too large a scale without adequate previous experience, some disappointment and pecuniary loss has resulted, and with it acrimonious discussions and recriminations, even in the public press. Since, in this connection, the latter has been made the medium of reflections upon this department, and myself personally, a somewhat detailed statement of the whole subject seems to be called for.

It is well known that the value of the beet for sugar manufacture depends, not only upon the absolute sugar percentage, but very essentially upon the amount and character of other substances that may be associated with it in the juice, or extract. I have, in previous reports, treated the subject of the ash ingredients of California-grown beets somewhat elaborately; the general result being, that while there are soils and places where sugar beets suitable for sugar manufacture cannot be grown, yet on the whole the beets grown in suitable locations in California are of unusually high grade, both as to sugar percentage and "purity-coefficient;" the latter term being applied to the number expressing the percentage of sugar contained in the solid contents of the juice, taken as one hundred in every case. Thus, a juice containing only eight per cent. of sugar may be worked with profit, provided its purity-coefficient be sufficiently high—*e. g.*, 85 per cent. of the total solid matter in it—while even with 14 per cent. of sugar it may be rendered undesirable if the purity-coefficient fall much below 70, or the ash ingredients be too abundant or alkaline.

The drying of beets for the purpose of preservation during the entire year, cheapness of transportation, etc., has long been proposed, and, to some extent, carried into practice. But the great expense of drying by fire heat, necessary in the countries where beet sugar has chiefly been made thus far, has rendered the process unprofitable, notwithstanding the advantage of a higher purity-coefficient of the extract, resulting from the fact that in that drying process a portion of the impurities of the fresh juice are rendered insoluble, and thus remain behind in the leached pulp of fire-dried beets.

The hot and dry summer climate of California, which adapts it to raisin-making, seems to offer exceptional conditions, not thus far realized anywhere else, for the economical production of dried beets. Small scale experiments made in this direction last year, and recorded in my last report, seemed to confirm fully the practicability of establishing the beet sugar industry on that basis; and, notwithstanding the partial failures recorded from this year's experience, I am still of the opinion that it only requires a little more experience in the management of the drying process, to render the dried beet crop quite as certain and safe, as to quantity and quality, as any other now grown. At the same time, the failure of the apparatus successfully used for the manufacture of sugar from fire-dried beets, to accomplish the same object in the case of the sun-dried article, places the latter simply on a level with the fresh beet, so far as the purity coefficient is concerned; always provided, that the drying process has been properly conducted, under reasonably favorable atmospheric conditions.

That this is really so, is proved by the assays made of dried beets furnished by Mr. Gennert and Mr. R. Nadeau, of Los Angeles (the latter one of the parties most heavily interested in the enterprise), which are given below. In order to understand the bearing of the data given, it is necessary to refer briefly to the method of assay, pursued in the case of dried beets. This is not as easy a matter as that of fresh roots, in which case the juice can be pressed, and its quality ascertained, in a very short time. In that of dried beets the substance has to be extracted with water; and according to the quantity and temperature of the latter, the results, especially as to the purity-coefficient, may vary materially. In the practice of the manufacturer, a certain percentage of sugar is always left behind in the residues, there being a point beyond which it will not pay to continue the extraction. But in an assay this is inadmissible; it being required to know the absolute sugar percentage, the extraction must be complete. This, however, requires so much time, that not only is there risk of a change in the first portions of the extract, by fermentation; but the lengthy treatment also carries into solution a larger amount of "non-sugar," or impurities, than would be the case on a manufacturing scale, and thus vitiates (depresses) the purity-coefficient.

After a number of experiments, the following general method was determined upon and adhered to: Thirty grams of dried beets were finely "hashed," and then allowed to soak over night, in an amount of water sufficient to swell them to their natural bulk, and cover them over. In the morning, the swelled beets were placed in a displacement apparatus, and water kept to fifty degrees centigrade was allowed to pass through slowly, so as to amount to six hundred cubic centimetres, more or less, by three o'clock in the afternoon; by which time the extract had ceased to show any sugar in the polarizer. The residue was then pressed, for the last portions of the juice, and the extract immediately treated in accordance with the usual methods pursued in the case of fresh juice.

The results given in the table, with the exceptions noted, were obtained according to this process. In judging of the variations, it must also be kept in mind that the amount of moisture contained in the sample at the time the test was made, was not in every case determined. The average commercially assumed is about ten per cent; but in small samples exposed to the air, it may vary from about seven to twelve, and more. This of course produces an apparent variation in the sugar-percentage, which, however, is unimportant for the present purpose.

No. 1. Sliced and dried beets received from E. Th. Gennert, Los Angeles, September 20, 1880. Grayish-white, uniformly brittle. Under the microscope, show on the surface abundant brownish crystals of cane sugar. Taste, that of fresh beets; color of the xtract, the same as fresh juice.

No. 2. Sliced and dried beets, received from the hand of R. Nadeau, of Los Angeles, October 5. Aspect, color, etc., about the same as in No. 1; color of extract, the same; sugar crystals on surface not quite so abundant.

No. 3. Two fresh beets, sent from Alvarado Sugar Factory, said to come from R. Nadeau, Los Angeles, and presumed to represent the quality of the beets dried by him. Slightly wilted when received, October 31, but otherwise in good condition. Each was separately assayed.

	Specific gravity of juice or extract.	Solid contents in juice or extract.	Percentage of cane sugar.	Purity coefficient.
No. 1. Dried beets, from E. Th. Gennert:				
A	----------	----------	51.33	----------
B	----------	----------	50.00	----------
C	1.0105	2.69	56.34	79.92
No. 2. Dried beets, from R. Nadeau:				
A	----------	----------	42.07	----------
B	1.0100	2.56	46.05	68.40
C	1.0108	2.77	46.87	69.9
No. 3. Fresh beets, from R. Nadeau:				
A	1.070	17.14	12.8	74.9
B	1.071	17.14	12.3	71.5

Determinations A and B, No. 1, were made before the regular process above detailed, had been adopted, and are affected by incomplete extraction as well as by a high percentage of moisture. The same is true of A, No. 2. The last determination in each case I consider the true standard of comparison, the others being simply corroborative and minimal. It will be seen that in the case of Nadeau's beets, the fresh and the dried beets accord in regard to purity-coefficient, quite as nearly as is commonly the case with different samples of fresh beets. *If there has been any lowering of this important factor by the drying process, it has been insignificant.* Moreover, the percentage of sugar in the dried sample is almost precisely what it should be, in the accepted proportion of four parts by weight of green beets to one of dried.

The conclusion is, that green beets of proper grade for sugar making do not lose their usefulness for this purpose, in any sensible degree, by a *carefully conducted* process of sun-drying in the climate of Los Angeles. This is abundantly corroborated by the results obtained from the sample furnished by Mr. Gennert, evidently made from a beet of higher sugar percentage than the average (which seems to be about twelve per cent.), and also of high purity-coefficient. No sugar maker could desire a finer material to work upon.

In the face of these facts, which only confirm the reasonable supposition of any one familiar with the subject and with the climatic conditions of southern California, the statement somewhat industriously circulated, that the whole scheme is a failure, appears rather premature. There certainly has been a failure of success in treating the sun-dried beets like those dried at a higher temperature; and it is greatly to be regretted that this important point was not ascertained before heavy investments in beet drying were made. In addition, there has been a partial failure to manage the drying process so as to secure a uniformly good product; and this, as might be expected, has carried with it a failure to produce from the resulting material, such average of sugar as might have been justly expected from the quality of the green beets, as well as from the assays above reported.

My attention was drawn to this fact by a communication from Mr. E. H. Dyer, Superintendent of the Alvarado Sugar Factory. He states, that the sugar obtained from the working of five tons of Mr. Nadeau's dried beets, had yielded only twenty per cent. of manufactured sugar; and sent, at the same time, a sample of dried beets, stated to be similar in quality to the lot used in the experimental manufacture. The fresh beets furnished by Mr. Nadeau, and reported above, came in the same package.

This sample of dried beets differed very obviously in appearance from those furnished by Mr. Gennert and Mr. Nadeau. Its aspect was darker, and inspection, as well as microscopic examination, showed it to consist largely—to the extent of about one half by bulk—of brown, soft shreds, with but few sugar crystals on their surface. Some of these showed, on the cross cut, a white center streak, within the brown covering. The lack of sweetness, and the difference of taste, was noticeable at once. The different portions of the sample, moreover, differed in the proportion of the sound white fragments intermixed with the brown.

The first sample assayed (A) was taken from the surface of the batch, as it came, and treated in the usual manner. The extract was very dark and brownish, and obviously very impure. Its sugar percentage, given under A in the following table, was found so low as to render it superfluous to determine its purity-coefficient, as it obviously could not be used in sugar manufacture.

The sample for B was taken from the bottom of the original sample, the latter having been turned out of the box containing it. The extract was not so dark as in the preceding sample.

For determination C, the entire contents of the box were thoroughly mixed by hand, then half of it taken and finely hashed, so as to be sure of a fair average of the whole. The depression of the purity-coefficient in this assay is partly due to longer extraction, obtaining 850 cem. of extract, instead of 600.

	Specific gravity of juice or extract.	Solid contents in juice or extract.	Percentage of cane sugar.	Purity coefficient.	Moisture per cent.
Dried beets from Alvarado					
A			23.29		
B	1.012	3.09	34.15	51.46	11.50
C	1.0065		26.24	47.00	

A comparison of these results with those recorded on the previous table, shows an enormous difference, not only in the sugar percentage (nearly two to one), but also a depression of the coefficient of purity, which renders the material altogether unfit for the purposes of the sugar maker. Not even the twenty per cent. actually produced from the five tons (as stated by Mr. Dyer) could be worked out of such half-spoiled stock. It appears from a subsequent statement of Mr. Dyer, that the sample sent was "taken at random," and, as claimed, out of the same "lot" as the sample brought by Mr. Nadeau. The conclusion is inevitable that said lot was badly mixed, and that in taking a handful at "random," instead of sampling carefully at many different points, and averaging, the sampler at one time happened upon a batch that was properly dried, while at another he hit the opposite extreme. What was the real average condition of the five tons worked, and what is that of the remaining portion of a fifty-ton lot sent to Alvarado by Mr. Nadeau, I can only conjecture; the attitude assumed by Mr. Dyer since the communication of my results, having obliged me to decline any further steps in the matter. In the interest of a promising industry, however, it would be very desirable that the causes of this unsatisfactory condition of a portion of Mr. Nadeau's beets should be fully investigated. It seems most probable that exposure to damp air, fog, or drizzle, after drying, and packing away without previous drying off, caused the damage, and that these damaged lots were carelessly intermingled with the rest.

Such, in my estimation, is the extent and amount of the reported failure of the beet-drying experiment. It is not unusual that such mistakes are made in the infancy of a new industry or improvement, or that manufacturers and others, having their regular routine and established interests, should assume a negative attitude toward it. It may even for a time be dropped altogether; but if intrinsically sound, as I fully believe the beet-drying industry will prove to be, it will in time find its place among the recognized branches of California agriculture.

In addition to the assays of beets above reported, one other has been made of a lot of beets grown by Mr. J. M. McElhany, of San Luis Obispo. It was of the crop of 1879, but being received too late, (December 18,) for insertion into last year's report, it is given here. These beets were somewhat shrunken, but otherwise in good order. One had the reddish color of a common beet, the other less red, and more like a regular sugar beet. A portion of each was taken, and the two samples mixed for analysis:

	Specific gravity of juice.	Solid contents in juice.	Percentage of cane sugar.	Purity-coefficient.
Fresh beets from San Luis Obispo	1.071	17.0	13.0	76.5

These figures, it will be noted, agree very closely with those obtained from the beets grown by Mr. Nadeau, near Los Angeles. It should not be forgotten, that almost all have been grown on comparatively fresh soils, on which the best results of sugar-beet culture are rarely attained.

SUGAR CANE, SORGHUM, AND CORN.

The continued interest in the subject of sugar production at home, as well as the desire for a greater diversification of crops, has induced numerous experiments in the growing of sugar-producing plants during the past season. This has especially been the case in the upper San Joaquin Valley, Kern, Tulare, and Fresno Counties. The cold, foggy Summer has been a drawback to the development of the saccharine juices, and the results have probably been as little favorable as they are ever likely to be. No samples of sugar cane have been sent for examination, but the reports thus far received have been encouraging. Whether the early frosts experienced this season have injured the cane, I am not informed.

Samples of sorghum were received from Bakersfield, Kern County, from Mr. J. W. A. Brooks, Secretary of the Kern County Improvement Association, under whose auspices seed was distributed last Spring. The results of the tests are given in the following table.

No. 1. Early Amber, from Bakersfield, was considerably wilted when worked. Received October 5, 1880.

Nos. 2 and 3. The Imphee and Minnesota Amber cane, from Bakersfield, were rather wilted, but not so dry as No. 1. Received November 15, 1880.

No. 4. The Amber, from University grounds, was worked the same day it was cut—November 16, 1880.

No. 5. Cuzco corn, grown by Mr. Chabot, of Fruit Vale, near Oakland. Fresh, and very succulent. Received in October, 1880.

	Specific gravity of juice.	Solid contents in juice.	Percentage of cane sugar.	Purity-coefficient.
No. 1. Early Amber, from Bakersfield	1.082	19.87	15.15	76.75
No. 2. Imphee, from Bakersfield	1.095	22.60	9.30	58.80
No. 3. Dark early Minnesota Amber, from Bakersfield	1.100	24.60	14.3	58.2
No. 4. Early Amber, University grounds	1.076	18.55	13.67	76.39
No. 5. Cuzco corn stalk, Oakland	1.050	12.61	7.05	64.00

It appears from the above table that the Early Amber Cane, even in the past unfavorable season, has, in Kern County, attained a sugar percentage almost equal to the average of Louisiana sugar-cane, with a very satisfactory purity-coefficient, between 76 and 77; and even in the cool Bay climate, and under the summer fogs of the Golden Gate, it has reached thirteen and two thirds per cent., with an equally good purity-coefficient. The "Dark Early Minnesota Amber" has rather too low a purity-coefficient for sugar-making—at least at the time when tested. It seemed a little past the best condition.

The Imphee is very far inferior to the Early Amber, and, as the sample stood, would not even have made very good syrup.

The stalk of Cuzco corn, though having a somewhat higher purity-coefficient than the Imphee and Dark Amber, would also serve for syrup only; and considering its low percentage in the juice, and smaller production on the same area, there can be no reason to prefer it to the Amber Cane. The latter seems therefore decidedly the crop to select for sugar-making, unless, indeed, the true sugar-cane should yield a much better result than there is reason to anticipate—considering experience in the Southern United States. The rapid growth and early maturity of the Early Amber alone recommend it highly, as against the tardy maturity and frequent damage from frost, that proverbially render the culture of the true sugar-cane in Louisiana a matter of thirteen months' work, and very liable to accident.

ORANGES AND LEMONS.

Six samples of oranges were forwarded by the Executive Committee of the Riverside "Citrus Exhibition," with request for analysis. The subjoined table exhibits the results obtained, so far as the scanty supply of material would permit. It should be understood that for some of the determinations as many as four of the smaller oranges are indispensable.

The analyses of several other kinds are given in Nos. 7, 8, and 9.

No. 1.—(Two oranges.)—Navel Orange (premium).

No. 2.—(Two oranges.)—Seedling (premium); Garcelon.

No. 3.—(Two oranges.)—Kona; Garcelon.

No. 4.—(Two oranges.)—St. Michael's; Garcelon.

No. 5.—(Two oranges.)—Seedling; T. J. Wood.

No. 6.—(Two oranges.)—Bergamot; Garcelon.

No. 7.—Mandarin orange, sent by Mr. A. B. Chapman, Los Angeles; received February 10, 1880.

No. 8.—Japan oranges, presented by Mr. E. V. Cowell. They were considerably dried up when analysed, and in spots somewhat decayed.

No. 9.—Wolfskill's "XX Lemon," grown by J. W. Wolfskill, Los Angeles; received March 15, 1880.

NUMBER.		Total Weight in grams.	Pulp—per cent.	Skin—per cent.	Specific Gravity of Juice.	Amount of Solid Matter—per cent.	Acid—per cent.	SUGARS.	
								Cane—per cent.	Sevulose—per cent.
1		228.5	78.44	21.56	1.047	11.57	0.749	3.95	1.62
		234.7	78.46	21.54					
2		200.0	68.75	31.25	1.050	12.28	0.767	5.78	1.935
		197.7	66.42	33.58					
3		223.0	70.5	29.5	1.049	12.05	0.998	4.43	1.308
		185.1	73.21	26.79					
4		143.0	81.82	18.18	----------	----------	1.305	5.04	1.655
		133.3	80.72	19.28	----------	----------			
5		192.8	75.52	24.48	----------	----------	1.919	5.1	1.505
		165.5	65.44	34.56	----------	----------			
6		85.5	66.32	33.68	----------	----------	4.365	----------	----------
		88.5	66.68	33.32	----------	----------			
7		141.3	74.5	25.5	----------	----------	0.920	6.1	1.34
8	*a* *b*	108.6	----------	----------	----------	----------	0.691	7.24	2.14
	c	59.4	88.7	11.3					
9		133.6	88.97	11.03	----------	----------	7.31	----------	----------

The extraordinary amount of acid in number six, creates a suspicion that it was not fully ripe; but the material was insufficient for a sugar determination. The acid-percentage of the Wolfskill "XX" lemon is above the usual average.

APPENDIX NO. 3.

REPORT ON INSTRUCTION GIVEN, AND CULTURE EXPERIMENTS.

BY CHAS. H. DWINELLE, LECTURER ON PRACTICAL AGRICULTURE, AND IN CHARGE OF FIELD EXPERIMENTS ON THE AGRICULTURAL GROUNDS.

Professor E. W. Hilgard:

SIR: I herewith submit a general report on the work of the past year, in the lecture room and experiment grounds, together with the details of some of the results reached in the latter.

Respectfully,
C. H. DWINELLE,
Lecturer on Practical Agriculture.

INSTRUCTION.

Students in agriculture come regularly under my instruction in Senior year, although irregular, or special, students and visitors have, at times, attended my lectures for a longer or shorter period. During the first term, beginning in August, a course of lectures is given on the General Principles of Stock Breeding, and their special application in the rearing of Cattle, Horses, and Sheep. These subjects, with Mr. E. J. Wickson's course on Dairy Husbandry, occupy the first term. The second term is devoted to Farm Implements and Machinery, principles and practice of Tillage, Irrigation and Drainage, and General Field Crops. Formal lectures are sometimes replaced by visits to the field and garden, or by excursions to farms, dairies, and other establishments, where the production and use of the fruits of the soil can be studied.

Our garden has added very largely to our specimens for object teaching, particularly in the subject of cereal grains. Friends in various parts of the State have also contributed liberally of specimens of grain, both in the head and cleaned.

OBJECT AND RESULTS OF THE TRAINING GIVEN.

We have a right to feel encouraged by the record for practical efficiency made by some of the students that have gone from this institution to the farm during the past season. It can now be asserted, with more assurance than ever, that young men of good character, who have taken a thorough course of study here, will quickly make themselves familiar with the details of any agricultural establishment, and show the value of a liberal training in their calling. On the other hand, it seems necessary to again disclaim the possession of any patent right method by which a young man can be given the gray hairs and wordly wisdom of his grandfather in the space of four years. The idea that such a process exists is more widely spread than is creditable to a community with the average intelligence which we claim for ours. It is worthy of the good woman who wished to buy a "capacity" for her daughter, who was behind her mates at boarding school.

College studies are primarily of use in enlarging and quickening the powers of the mind. The studies of the College of Agriculture are arranged to add to this general culture a special training of those faculties, and an accumulation of facts bearing upon those subjects, which are of most importance to the agriculturist. These are a good foundation to build upon, but they cannot take the place of those traits of character and years of experience which are in the possession of the successful man who has been through the battle of life. We are glad to note an inclination among our students to take special studies with us after graduation. This suggests the possibility, in the future, of having a regular post-graduate year, perhaps leading to a higher degree. There would then be time for lectures on Horticulture, Veterinary Science, and kindred subjects, which are now omitted on account of the crowding of other fundamental studies. This would be a step in advance, not only for this department, but also for the whole institution as a true University.

FIELD EXPERIMENTS.

The work in the experimental grounds has been devoted to a very considerable variety of those subjects of inquiry which seem to be of importance to the cultivators of the soil in California, and which few of them have the time or means to investigate themselves. When our observations, or those of others, settle an agricultural question, one way or the other, we are of course at liberty to drop the subject, and turn our attention to some of the new issues that are continually arising. Most experiments in agriculture need to be repeated for a number of years in succession, in order to get fair average results, free from the unusual influences which may disturb those of one year, as variations of weather, blights, insect ravages, and the like. Some of the leading subjects of investigation have been as follows:

A TEST OF COMMERCIAL FERTILIZERS.

Some of those fertilizers having an established reputation elsewhere, and other comparatively new ones, are tried as to their effect upon our clay (adobé) ridge soil, which closely resembles in character a vast amount of land in the State. Some of these dressings serve directly as plant food, others improve the mechanical condition or tilth, and in some cases one may accomplish both ends, and also act as a weed exterminator. Some of the details of this year's results are given further on in this report.

HAY MAKING.

To find the comparative weight of hay given by the equal areas of land devoted to cereals, when cut in bloom, and when left until the grain is fairly formed and in the dough, and also the nutritive value of the two cuttings. As these trials are made with both wheat and oats, the comparative value of the two grains as forage will also be shown. Their very general use as such on this coast makes such determinations of considerable importance.

HARROWING GRAIN DURING GROWTH.

There is a widespread opinion that if grain is harrowed after its roots are firmly set in the ground, it will yield a heavier and better crop. We have begun trials of this, both as to improvement, and the best time for harrowing, and the most suitable implement.

BROADCAST VS. DRILL CULTURE.

This is most important in its bearings on the amount of seed required, the protection against birds at sowing time and when the grain has sprouted, evenness of growth, and plumpness of the berry. The desirability of the cultivation of cereals during growth, as is largely practiced in England, Europe, and Japan, is becoming very apparent to residents of older parts of the State, where noxious weeds are increasing in variety and number, and often greatly lessen the quality and quantity of the yield. If cultivation is shown to materially improve the crops, there is little doubt that cheap ways of doing the work will be found.

Since writing the above the following letter has been received in answer to one making inquiries in regard to the points touched upon. The writer is Mr. Hugh A. Teel, formerly a student in this institution, but for some time past engaged upon the farm of the late Wm. Meek, in this county. It has such a practical bearing upon the question in hand, that it is here given nearly in full:

"We use the Statesman two-horse drill; and also the Superior four-horse drill. I have no doubt that there are others equally as good. The Statesman has twelve drills, seven inches apart. In rich land but six of the drills are used, which will make the rows fourteen inches apart. In poor land all of the drills are used, and the grain cannot then be cultivated. The machine will run as well with six as with twelve drills.

"We drill Chevalier barley and wheat. I have never seen any common barley drilled. Oats are seldom raised in this neighborhood. When the grain is sown in rows fourteen inches apart it is always cultivated. We use a common weed cultivator. I know no other name for it. All the teeth but three are taken out, one in the center, and one on each side. This enables one to cultivate three rows at a time, while the horse walks in the center row. Cultivate as soon as you can see the rows, when the grain has come up. When the grain is about four inches high, cultivate the second time. Directions are given with the drill for the amount of seed to be used per acre. This would vary with the quality of the soil supply of available moisture, etc., C. H. D.

"Drill sowing is undoubtedly superior to broadcast sowing. The grain grows ranker and is not so liable to lodge. The yield per acre is better, and the grain is plumper. Cultivating not only kills the weeds, but also enables the grain to stand the drouth better. In a dry year, I have seen more bushels and plumper barley taken from drilled grain, than from the same number of acres, in the same field, sown broadcast. In drilling the grain will stool well, requiring less seed. The difference in seed will pay the expense of cultivating."

COMPARATIVE VALUE OF DIFFERENT VARIETIES OF GRAIN.

This involves a consideration of not only the actual weight of the crop, but also its character as food for men and beasts; its desirability for the shipper, miller, brewer, or as forage. The ability to resist disease, rust, smut, and mildew, as well as to withstand the attacks of insect enemies, is of prime importance.

CAN RUST BE AVOIDED?

This subject is still in obscurity, in spite of the many elaborate investigations which have been made as to its occurrence and possible remedies. A careful experiment was undertaken on our grounds the past season, to test the value of a dressing for the seed, made of strong brine, thickened with lime. A coating of this was applied to six kinds of wheat, and one of oats, which were sown in drills, side by side. The drills were run across a piece of land on which oats rusted very badly the previous season, and another piece on which there had been no rust. The object of this was to see whether a contamination of the soil by rust spores had any effect on the succeeding crop; in other words, whether the rust fungus attacks grain through the roots rather than the leaves. Unfortunately, for the value of our results, this was not a rusty year. About the time that there were suggestions of it in the appearance of the leaves of some of the grains, a hot, dry, north wind took up all superfluous moisture from both soil and crops, and removed all danger on that score.

ACCLIMATIZATION AND DISTRIBUTION OF GRAINS.

A large number of cereals, wheat, rye, barley, and oats, something like one hundred and seventy-five kinds in all, have been collected, mainly from foreign sources. These are being acclimatized and propagated for future distribution, if found of sufficient value to warrant it. A detailed account of observations upon them will be prepared as soon as we can judge of their value. In the list published with this report, those familiar with the grains of the Old World will recognize some which have long had an established reputation for excellence. The change of climate has proved a shock to most of the wheats, which it will take a year or two to recover from. The ryes and barleys are generally well developed, while the oats are indifferent.

PUBLICATION OF RESULTS.

We are accumulating a very valuable body of facts and figures relating to the subjects mentioned. These will be arranged for publication from time to time, as reasonably clear conclusions can be drawn from those relating to special subjects, and as rapidly as will be permitted by the duties of the lecture room, and the maintenance of a large correspondence on agricultural matters with the farmers of the State.

DETAILS OF EXPERIMENTS WITH FERTILIZERS.

Several agricultural experts from England, who have lately visited the United States to investigate the sources of the flood of cheap grain which is inundating their country, have gone home and reported that our competition could not be of long duration. While admitting the great extent and richness of our land, and the wonderful skill shown in the invention and use of labor-saving machinery, they witnessed such wasteful practices as to lead them to the conclusion that the fertility of the soil would soon become so diminished that there would be little, if any, grain produced for export. It is to be hoped that this view, even if it be exaggerated, may set our people to thinking seriously whither they are drifting.

Although a majority of the farmers of California have been very prodigal with the crop elements of their soil, there is a considerable, and we are happy to say, increasing body among them, who aim to maintain, and where possible, add to their resources in this respect. It is for the benefit of this class, and through them the State at large, that these investigations are made. We trust that our results may not be without interest to them. They certainly begin to show, with a good deal of clearness, what may be done with a clay ridge soil like ours, and should stimulate farmers to experiment in the same direction.

SERIES OF PLOTS DRESSED IN 1878–9.

Last year two series of fertilizer plots were reported upon, which had been devoted to grain—wheat and oats—which was thrashed. During the season of 1879–80 these series have received no dressing, as we wished to test the duration of the effects of that applied in 1878–9. They were sown with wheat and oats, each kind of grain being put upon the ground devoted to the other the year previous, thus giving a rotation. The land was plowed once, and harrowed four times, twice before and twice after sowing. Seed was applied at the rate of 150 pounds to the acre. Both the wheat and oats on the eastern series, and the oats on the western series, were soaked for fourteen hours in a solution of bluestone—sulphate of copper—and dried off with a dusting of lime to prevent smutting. The wheat on the western series was soaked but two hours, and no lime was used upon it. The sowing was done on the 16th and 18th of December, 1879. The resulting crops were cut and cured for hay in June, 1880. The wheat was cut with scythes on the 15th—being then in the milk—and the oats were cut on the 18th, when in bloom, or just past it.

The hay was raked into windrows on the afternoon of the day when cut, and made into cocks the next day. The crop of each plot was weighed from the cock and recorded, the weighing being done from the 23d to the 26th of June.

The results are shown in Tables I, II, III, and IV, which correspond with those bearing the same numbers in last year's report:

"The eastern series, Tables III and IV, lie next to the orchard, and are numbered from south to north. The western series, Tables I and II, lie next the fence on the western boundary of the University grounds, and are numbered from south to north. The fertilized plots, and those alternating with them in the outside tiers, contain $\frac{1}{20}$ of an acre 4 rods by 2, while the central unmanured tiers, designated as $1\frac{1}{2}$, $2\frac{1}{2}$, etc., are but $\frac{1}{40}$ of an acre in area. For convenience in comparison, however, the products of these half plots have, in all cases, been multiplied by 2 in making up the tables, so that we have to deal uniformly with $\frac{1}{20}$ of an acre.

"The fertilizers used are noted, with the amount applied to each plot, and also the rate and cost per acre. The cost of the fertilizers is reckoned on a basis of their net cost delivered here in quantities of one or more tons, and not the actual cost of such small quantities as were used.

"In our estimates the weight of crops is given in pounds avoirdupois, and the corresponding rate per acre given in tons of 2,000 pounds for straw and hay, and bushels for grain, 60 pounds of wheat and 32 of oats being the legal standards in this State. In some cases, where the circumstances warrant a definite conclusion, the increased value of the fertilized crop is computed. The prices given to produce are those ruling in this neighborhood in December, unless otherwise stated."

TABLE I.

Culture Experiments with wheat and oats raised for hay, 1879–80, *to test the duration of the effects of fertilizers applied in* 1878–9. *Western series. Kind, amount, and cost per acre of fertilizer used. Weight and rate per acre of product. Increased value of crop per acre, where it can be computed. Plots* 2 *rods by* 4=$\frac{1}{20}$ *of an acre.*

Hay----	WHEAT.	(Plot 1.) Unmanured. 256lbs.=2.56 T. per A.	(Plot 2.) Unmanured. 277lbs.=2.77 T. per A.	(Plot 3.) Unmanured. 248lbs.=2.48 T. per A.	(Plot 4.) 30lbs.=600lbs.@$9 75 per A. Bone meal. 411lbs.—4.11 T. per A. Increased val. in '80--$20 04 Increased val. in '79-- 14 94 $34 98	(Plot 5.) Unmanured. 266lbs.=2.66 T. per A.	(Plot 6.) 50lbs.=1,000lbs.@$7 27 per A. Lime. 358lbs.=3.58 T. per A. Increased val. in 1880, $5 40.	WHEAT.
Hay----		(Plot 1½.) 212lbs.=2.12 T. per A.	(Plot 2½.) 216lbs=2.16 T. per A.	(Plot 3½.) 218lbs=2.18 T. per A.	(Plot 4½.) 266lbs=2.66 T. per A.	(Plot 5½.) 256lbs=2.56 T. per A.	(Plot 6½.) 302lbs=3.02 T. per A.	
		U	**N M**	**A**	**N U**	**R**	**E D.**	
Hay----	OATS.	(Plot 1½.) 222lbs.=2 22 T. per A.	(Plot 2½.) 204lbs.=2 04 T. per A.	(Plot 3½.) 204lbs.=2.04 T. per A.	(Plot 4½.) 344lbs.=3.44 T. per A.	(Plot 5½.) 314lbs.=3.14 T. per A.	(Plot 6½.) 316lbs=3.16 T. per A.	OATS.
Hay----		(Plot 1.) Unmanured. 224lbs.=2.24 T. per A.	(Plot 2.) 7lbs.=140lbs.@$14 00 per A. Ammonia Sulphate. 256lbs.=2.56 T. per A.	(Plot 3.) Unmanured. 249lbs.=2.49 T. per A.	(Plot 4.) 30lbs.=600lbs.@$9 75 per A. Bone meal. 518lbs.=5 18 T. per A. Increased val. in '80--$30 24 Increased val. in '79-- 8 28 $38 52	(Plot 5) Unmanured. 348lbs.=3.48 T. per A.	(Plot 6.) 50lbs.=1,000lbs.@$7 27 per A. Lime. 382lbs.=3.82 T. per A. Increased val. in '80-- $6 12 Increased val. in '79-- 9 48 $15 60	

TABLE II.

Culture Experiments with wheat and oats raised for hay, 1879–80, to test the duration of the effects of fertilizers applied in 1878–9. Western series. Kind, amount, and cost per acre of fertilizer used. Weight and rate per acre of product. Increased value of crop per acre, where it can be computed. Plot 2 rods by 4=$\frac{1}{20}$ of an acre.

WHEAT.	Hay....	(Plot 7.) Unmanured. 302lbs.=3.02 T. per A.	(Plot 8.) 30lbs.=600lbs @$9 75 per A. Bone meal. 281lbs.=2.81 T per A.	(Plot 9.) Unmanured. 163lbs.=1.63 T. per A.	(Plot 10.) 30lbs.=600lbs.@$7 27 per A. Plaster—Gypsum. 259lbs.=2.59 T. per A.	(Plot 11.) Unmanured. 281lbs.=281 T. per A.	(Plot 12.) 50lbs.=1,000lbs.@$7 27 per A. Lime. 399lbs.=3.99 T. per A.
	Hay....	(Plot 7½.) 341lbs.=3.41 T. per A.	(Plot 8½.) 249lbs.=2.49 T. per A.	(Plot 9½.) 202lbs.=2.02 T. per A.	(Plot 10½.) 222lbs.=2.22 T. per A.	(Plot 11½.) 238lbs.=2.38 T. per A.	(Plot 12½.) 314lbs.=3.14 T. per A.
		U	**N M**	**A**	**N U**	**R**	**E D.**
OATS.	Hay....	(Plot 7½.) 366lbs.=3.66 T. per A.	(Plot 8½.) 248lbs.=2.48 T. per A.	(Plot 9½.) 236lbs.=2.36 T. per A.	(Plot 10½.) 212lbs.=2.12 T. per A.	(Plot 11½) 313lbs.=3.13 T. per A.	(Plot 12½.) 424lbs.=4.24 T. per A.
	Hay....	(Plot 7.) Unmanured. 310lbs.=3.10 T. per A.	(Plot 8.) 30lbs.=600lbs.@ $9 75 per A. Bone meal. 268lbs.=2.68 T. per A.	(Plot 9.) Unmanured. 321lbs.=3.21 T. per A. The chaff from last year's thrashing was burned on this plot. Hence the large yield.	(Plot 10.) 30lbs.=600lbs.@$7 27 per A. Plaster—Gypsum. 211lbs.=2.11 T. per A.	(Plot 11.) Unmanured. 347lbs.=3.47 T. per A.	(Plot 12.) 50lbs.=1,000lbs.@$7 27 per A. Lime. 440lbs.=4 40 T. per A.

TABLE III.

Culture Experiments with wheat and oats raised for hay, 1879-80, to test the duration of the effects of fertilizers applied in 1878-9. *Eastern series (top of ridge). Kind, amount, and cost per acre of fertilizers used. Weight and rate per acre of product. Increased value of crop per acre, where it can be computed. Plots 2 rods by* 4=$\frac{1}{20}$ *of an acre.*

Hay----	OATS.	(Plot 1.) 30lbs.=600 lbs.@$9 75 per A. Bone meal. 230lbs.=2.30 T. per A. Increased val. in '80-- $6 12 Increased val. in '79-- 11 76 $17 88	(Plot 2.) Unmanured. 172lbs.=1.72 T. per A.	(Plot 3) 10lbs.=200lbs.@$20 per A. Ammonia Sulphate. 235lbs.=2.35 T. per A.	(Plot 4.) Unmanured. 198lbs.=1.98 T. per A.	(Plot 5.) 50 lbs.=1,000lbs.@$7 27 per A. Lime. 243lbs.=2.43 T. per A. Increased val. in '80--$6 96 Increased val. in '79-- 1 96 $8 92	(Plot 6.) 30lbs.=600lbs.@$7 27 per A. Plaster—Gypsum. 223 lbs.=2 23 T. per A.	OATS.
Hay----		(Plot 1½.) 182lbs.=1.82 T. per A.	(Plot 2½.) 182lbs.=1.82 T. per A.	(Plot 3½.) 200lbs.=2.00 T. per A.	(Plot 4½.) 168lbs.=1.68 T. per A.	(Plot 5½.) 180lbs.=1.80 T. per A.	(Plot 6½.) 196lbs.=1.96 T. per A.	
		U	**M**	**A**	**N** **U**	**R**	**E** **D.**	
Hay----		(Plot 1½.) 214lbs.=2.14 T. per A.	(Plot 2½.) 224lbs.=2.24 T. per A.	(Plot 3½) 169lbs.=1.69 T. per A.	(Plot 4½.) 140lbs.=1.40 T. per A.	(Plot 5½.) 183lbs=1.83 T. per A.	(Plot 6½.) 202lbs.=2.02 T. per A.	
Hay----	WHEAT.	(Plot 1.) 30lbs.=600lbs.@$9 75 per A. Bone meal. 224lbs.=2.24 T. per A. Increased val. in '80--$3 00	(Plot. 2) Unmanured. 160lbs.=1.60 T. per A.	(Plot 3.) 10lbs.=200lbs.@$20 per A. Ammonia Sulphate. 161lbs.=1.61 T. per A.	(Plot 4.) Unmanured. 111lbs.=1.11 T. per A.	(Plot 5.) 50lbs.=1,000lbs.@$7 27 per A. Lime. 158lbs.=1.58 T. per A.	(Plot 6.) 30lbs.=600lbs.@$7 27 per A. Plaster—Gypsum. 218 lbs.=2.18 T. per A.	WHEAT.

TABLE IV.

Culture Experiments with wheat and oats raised for hay, 1879–80, *to test the duration of the effects of fertilizers applied in* 1878–9. *Eastern series continued.*

OATS.	Hay--	(Plot 7.) Unmanured. (Limed in 1876.) 470lbs.=4.70 T. per A.	(Plot 8.) 50lbs.=1,000lbs.@$7 27 ⅌ A. Lime. 506lbs.=5.06 T. per A.	OATS.
	Hay--	(Plot 7½.) 314lbs.=3.14 T. per A.	(Plot 8½.) 404lbs.=4.04 T. per A.	
		UNMAN	URED.	
WHEAT.	Hay--	(Plot 7½.) 258lbs=2.58 T. per A.	(Plot 8½.) 404lbs.=4.04 T. per A.	WHEAT.
	Hay--	(Plot 7.) Unmanured. 313lbs.=3.13 T. per A. (Limed in 1876.)	(Plot 8.) 50lbs.=1,000lbs@$7 27 ⅌ A. Lime. 316lbs.=3.16 T. per A.	

The report of last year, on these series, showed that there had been, in some cases, a sufficient gain from the dressing used, to cover the outlay and leave a balance as profit; in others, there was a gain, but not enough to cover the cost, while others still showed no apparent return above the unmanured plots. The financial aspects have changed somewhat with the experience of an additional season.

EFFECTS OF THE FERTILIZERS. BONE MEAL.

Some of the bone meal plots come out exceedingly well. Plots 4, in the western series, both wheat and oats, are particularly notable in their yield. The wheat plot, if compared with the average yield of unmanured plots 3, 3½, and 4½, as was done last year, gives an increase of 1.67 tons of hay per acre, worth at least $12 per ton net, or $20 04 per acre. If to this we add $14 94, the increased value of the crop of oats and straw last year, the showing is certainly a favorable one, thus:

Increased value of crop of 1878–9	$14 94
Increased value of crop of 1879–80	20 04
	$34 98
Cost of bone meal, at 600 pounds per acre	9 75
Balance for profit and interest	$25 23

From this, there should properly be deducted 97½ cents on account of interest, at ten per cent., on the cost of the dressing for one year after it was applied. Turning to the oats, the increase over plots 3, 3½, and 4½, is 2.52 tons per acre, worth $30 24. The increase last year was $8 28.

Increased value of crop of 1878–9	$8 28
Increased value of crop of 1879–80	30 24
	$38 52
Cost of bone meal, at 600 pounds per acre	9 75
Balance for profit and interest	$28 77

The soil in this part of the grounds is very moist in winter, and it seems but proper to suppose that the greater effect of the dressing, as compared with the same on other pieces, is largely due to its being more perfectly dissolved. If any of our farmers have much land that will respond to the application of bone meal at this rate, the sooner they find it out the better, for the road to wealth is straight before them. Would it not be well worth the expenditure of a few dollars to decide the question? We hope that our bone meal factories may not much longer be obliged to seek their markets in other countries.

EFFECT OF BONE MEAL ON SORREL.

The crops on these two plots were not only heavy, but were also remarkably clean as compared with those about them. The adjoining plots are badly infested with sorrel (*Rumex Acetosella*), while there is much less of it on these two. This is certainly a valuable hint as to possible relief for those whose lands are overrun by this worthless weed.

Plot 8 in the series shows no marked results from the dressing, either this year or the last. In the eastern series, Plot 1, in oats, shows an increase of .51 ton, worth $6 12, to which is to be added that of the previous season.

Increased value of crop of 1878–9	$11 76
Increased value of crop of 1879–80	6 12
	$17 88
Cost of bone meal, at 600 pounds per acre	9 75
Balance for profit and interest	$8 13

This is not as good a result as was reached in plots 4 of the western series, but it is still good, as the soil is a very much poorer one. Plot 1, in wheat, gives only .25 of a ton above the average of adjoining pieces. Last year the oats upon it were hurt by small birds, so that its yield could not be taken as a fair indication of the effect of the dressing.

LIME.

In the western series, wheat, plot 6, compared with 6½, 7, and 7½, shows a gain of .45 of a ton of hay, worth $5 40, although last season this was not a remarkably good piece. The corresponding oat plot, compared with 6½, 7, and 7½, shows an increase of .51 of a ton, worth $6 12, to which is to be added $9 48 from last year:

Increased value of crop of 1878-9	$9 48
Increased value of crop of 1879-80	6 12
	$15 60
Cost of lime, at 1,000 pounds per acre	7 27
Balance for profit and interest	$8 33

Plot 12 in wheat is notably better than 12½, the only piece adjoining which is near enough in quality of soil for a fair comparison. As noted last year, 12 in oats can hardly be compared with others, unless it be with 11. Although the superiority is very marked, the lay of the land is such that it should not all be attributed to the lime. It is, however, undoubtedly to be set down as showing a profit from the application. Plot 12½ in wheat, by its heavy yield, seems to bear out the opinion expressed last year, that, as it lies lower than 12, it has, through the Winter rains, received considerable benefit from the dressing of lime applied there.

In the eastern series, plot 5 in oats, compared with 4, 4½, 5½, and 6½, shows an increase of .58 of a ton, worth $6 96. Last year, there was an apparent gain of 1.55 bushels of wheat, worth $1 96, so that the account now stands:

Increased value of crop of 1878-9	$1 96
Increased value of crop of 1879-80	6 96
	$8 92
Cost of lime, at 1,000 pounds per acre	7 27
Balance for profit and interest	$1 65

The effect on this piece of land seems to have been produced more slowly than on some others. It may prove none the less sure and profitable in the end.

Plot 5 of wheat has not shown any special benefit, either this year or last, and is still in debt for its dressing.

Plot 7 of oats, which was limed in 1876, again shows itself among the best, as it did last year, giving 1.56 tons better than 7½, which is a similar piece of land. The corresponding wheat plot also is superior to its neighbor, 7½, by .55 of a ton, and last year the difference was still greater.

Oat plot 8 gives 5.06 tons per acre, or 1.02 tons over 8½. These are both on some of the best land we have, but the liming still shows a great profit. Wheat plot 8 shows a less return than 8½, which is unmanured, but the latter has by nature the better soil, and has probably been benefited by percolation from the lime on 8.

In reviewing our experience with lime we can strongly commend it as likely to improve the tilth, and consequently the yield of stiff soils, particularly those which lie rather low. It might also prove profitable on alfalfa (lucerne), as a top dressing.

PLASTER OR GYPSUM.

One or two of the plots dressed with gypsum show a slight superiority, but it is so small as to be scarcely worthy of notice. This fact, taken with the record for the last season, shows gypsum to be far less valuable on our soil than either lime or bone meal. Of course, this does not necessarily detract from it in other situations, and where other ends are in view.

AMMONIA SULPHATE.

As was to have been expected, the ammonia sulphate seems to have been pretty well exhausted by last season's crop. At best its present high price in San Francisco cuts it off from the list of fertilizers that can be used on grain crops.

WHEAT AND OAT PLOTS FOR 1879–80.

Three additional series of plots have been laid off on the ridge parallel to and adjoining on the west the eastern series of 1878–9. These were devoted to testing the effects of lime, bone meal, Chili saltpetre, and dried meat, which were applied to the soil for the first time. The land in question had been in summer-fallow for two years previous, and had been plowed repeatedly to destroy the weeds, which sprung up whenever there was sufficient moisture for their germination. These series were devoted to wheat and oats, which were cut for grain, and the product of each plot in grain and straw recorded. The results are shown in Tables V to VIII. As the soil had rested for two years, and was in exceedingly good tilth from its frequent plowing, harrowing, and exposure to the elements, the crops on the whole series, both manured and unmanured, were remarkably good for land of that description. For this reason, the effects of fertilizers were less apparent than they probably would have been on a soil in poorer condition.

SELECTION OF SEED.

The seed wheat used was of our own raising, and of a kind bought in the market without any special name. It appears like the common Chili variety. The best and cleanest of this was chosen, and put through a variety of processes to still further improve its quality. First, it was run through the fanning mill, with all of the wind turned on, so as to blow out light grain and trash. After this it was thrown, a little at a time, into a saturated solution of salt in water, to get rid of grains of low specific gravity and weed seeds, by floating and skimming them off. To guard against smut, it was soaked for several hours in a solution of blue-stone, and dried off with a dusting of lime. This careful selection of the best kernels for seed undoubtedly had much to do with the high average crops for the season. The system is not an expensive one, and can be practiced by any farmer. The grain thus prepared can be kept for weeks without injury. Although light seed grain may produce a paying, or even remarkable crop, under very favorable circumstances, there is no question that, one year with another, the very best seed is the cheapest. The wheat was sown at the rate of 90 pounds to the acre, dry weight.

The oats sown were raised in Berkeley, from seed grown in Washington Territory, and were of good quality for our climate. We have not sufficient moisture to fully meet the wants of this crop, and any variety usually deteriorates when brought from the north. The seed was treated with blue-stone and lime, in the same manner as the wheat. The amount sown was 100 pounds per acre, dry weight.

MODE OF CULTIVATION.

The land was plowed nine to ten inches deep, and harrowed, the latter half of January, 1880. The bone meal, lime, and dried meat, were then applied to their respective plots, and worked in by means of a cultivator. On this the seed was sown from the 22d to the 27th of January, and twice harrowed. Bone meal was used at the rate of 600 pounds per acre, lime 1,000 pounds, ground dried meat on Plot 5, Table V, 600 pounds, on Plot 1, Table VIII, 500 pounds. On March 15th, Chili saltpetre was applied in solution to Plot 7, Table VI, and Plot 3, Table VIII, at the rate of 200 pounds per acre.

HARVESTING.

These crops were cut with a cradle the latter part of July, bound in sheaves, and shocked up to cure. They were thrashed from the shock, with flails, and the grain was cleaned by a hand fanning mill, weighed, and the weight recorded in a book, and upon a tag fastened to the bag with wire. The weight of the straw was also taken as it came from the floor. The wheat made a very handsome growth, and the grain is of good quality for our coast climate, though not as well filled as might have been the case if we had not been visited by one of our dry north winds, as it was ripening. From the same cause the oats have a light berry, though their aggregate weight per acre is large.

TABLE V.

Culture Experiments with fertilizers on wheat and oats, 1879-80. *Second Series from the orchard, on the ridge. Kind, amount, and cost per acre of fertilizers used. Weight and rate per acre of product. Plots,* 2 *rods by* 4=1/20 *of an acre.*

WHEAT.	Straw Grain	(Plot 1.) 50lbs.=1,000lbs @$7 27 perA. Lime. 192lbs.=1.92 T. per A. 106lbs.=35.33 bus. per A. A part inferior on account of drowning out.	(Plot 2.) Unmanured. 254lbs.=2.54 T. per A. 137lbs.=45 66 bus. per A.	(Plot 3.) 30lbs.=600lbs@$9 75 per A. Bone meal. 330lbs.=3.30 T. per A. 145lbs.=48.33 bus. per A.	(Plot 4.) Unmanured. 190lbs.=1.90 T. per A. 107lbs.=35.66 bus. per A.	(Plot 5.) 30lbs.=600lbs.@$12 60 per A. Dried meat. 219lbs.=2.19 T. per A. 109lbs.=36.33 bus. per A.	(Plot 6.) Unmanured. 138lbs.=1.38 T. per A. 80.25lbs.=26.75 bus. per A.
	Straw Grain	(Plot 1½.) 193lbs.=1.93 T. per A. 116lbs.=38.66 bus. per A.	(Plot 2½.) 284lbs.=2.84 T. per A. 134lbs.=44.66 bus. per A.	(Plot 3½.) 308lbs.=3.08 T. per A. 140lbs.=46.66 bus. per A.	(Plot 4½.) 236lbs.=2.36 T. per A. 107.5lbs.=35.83 bus. per A.	(Plot 5½.) 151lbs.=1.51 T. per A. 76lbs.=25.33 bus. per A.	(Plot 6½.) 158lbs.=1.58 T. per A. 90lbs =30 bus. per A.
OATS.	Straw Grain	(Plot 1½.) 230lbs.=2.30 T. per A. 122lbs.=76.25 bus. per A.	(Plot 2½) 278lbs.=2.78 T. per A. 152lbs.=95 bus. per A.	(Plot 3½.) 222lbs.=2.22 T. per A. 134lbs.=83.75 bus. per A.	(Plot 4½.) 162lbs.=1.62 T. per A. 95lbs.=59.37 bus. per A.	(Plot 5½.) 164lbs.=1.64 T. per A. 84lbs.=52.50 bus. per A.	(Plot 6½.) 131lbs =1.31 T. per A. 82lbs.=51 25 bus. per A.
	Straw Grain	(Plot 1.) 50lbs.=1,000lbs.@$7 27 perA. Lime. 211lbs.=2.11 T. per A. 100lbs.=62.50 bus. per A. Grain somewhat injured by small birds.	(Plot 2.) Unmanured. 234lbs=2.34 T. per A. 129lbs.=80.62 bus. per A.	(Plot 3½.) 30lbs.=600lbs.@$9 75 per A. Bone meal. 198lbs.=1 98 T. per A. 112lbs.=70 bus. per A.	(Plot 4.) Unmanured. 143lbs.=1 43 T. per A. 85.5lbs.=53 43 bus. per A.	(Plot 5.) 30lbs =600lbs.@$12 60 per A. Dried meat. 133lbs.=1.33 T. per A. 80lbs.=50 bus. per A.	(Plot 6.) Unmanured. 104lbs.=1.04 T. per A. 68lbs=42.50 bus per A.

TABLE VI.

Culture Experiments with wheat and oats, 1879–80. *Second series from the orchard continued.*

WHEAT.		(Plot 7.) 10 ℔s.=200 ℔s. @ $10 20 per A. Chili Saltpetre—Sod. nitrate.	(Plot 8.) Unmanured.
	Straw	192 ℔s.=1.92 T. per A.	241 ℔s.=2.41 T. per A.
	Grain	107 ℔s.=35.66 bus. per A.	129 ℔s.=43 bus. per A.
		(Plot 7½.)	(Plot 8½.)
	Straw	195 ℔s.=1.95 T. per A.	282 ℔s.=2.82 T. per A.
	Grain	101 ℔s.=33.66 bus. per A.	128 ℔s.=42.66 bus. per A.
OATS.		(Plot 7½.)	(Plot 8½.)
	Straw	152 ℔s.=1.52 T. per A.	240 ℔s.=2.40 T. per A.
	Grain	100 ℔s.=62.50 bus. per A.	134 ℔s.=83.75 bus. per A.
		(Plot 7.) 10 ℔s.=200 ℔s. @ $10 20 per A. Chili Saltpetre—Sod. nitrate.	(Plot 8.) Unmanured.
	Straw	166 ℔s.=1.66 T. per A.	243 ℔s.=2.43 T. per A.
	Grain	102 ℔s.=63.75 bus. per A.	137 ℔s.=85.62 bus. per A.

TABLE VII.

Culture Experiments with fertilizers on wheat and oats, 1879–80. *Third series from the orchard on the ridge. Kind, amount, and cost per acre of fertilizers used. Weight and rate per acre of product. Plots 2 rods by* 4=$\frac{1}{20}$ *of an acre.*

WHEAT.	Straw -- Grain --	(Plot 1.) Unmanured. 206lbs.=2.06 T. per A. 102.5lbs =34.16 bus. per A.	(Plot 2.) 50lbs.=1,000lbs.@$7 27 per A. Lime. 258lbs.=2.58 T. per A. 122.5lbs.=40.83 bus. per A.	(Plot 3.) Unmanured. 232lbs.=2.32 T. per A. 118lbs.=39.33 bus. per A.	(Plot 4.) 30lbs.=600lbs@$9 75 per A Bone meal. 371lbs.=3.71 T. per A. 145lbs.=48.33 bus. per A.
	Straw -- Grain --	(Plot 1½.) 201lbs.=2.01 T. per A. 103lbs.=34 33 bus. per A.	(Plot 2½.) 298lbs.=2.98 T. per A. 134.5lbs.=45.16 bus. per A.	(Plot 3½.) 271lbs.=2.71 T. per A. 130.5lbs.=43.50 bus. per A.	(Plot 4½.) 289lbs.=2.89 T. per A. 134lbs.=44.66 bus. per A.
OATS.	Straw -- Grain --	(Plot 1½.) 151lbs.=1.51 T. per A. 92lbs.=57.50 bus. per A.	(Plot 2½.) 240lbs.=2.40 T. per A. 138lbs.=86.25 bus. per A.	(Plot 3½.) 240lbs.=2.40 T. per A. 158lbs.=98.75 bus. per A.	(Plot 4½.) 259lbs.=2.59 T. per A. 136.5lbs.=85.31 bus. per A.
	Straw -- Grain --	(Plot 1.) Unmanured. 172lbs.=1.72 T. per A. 97lbs.=60.62 bus. per A.	(Plot 2.) 50lbs =1,000lbs.@$7 27 per A. Lime. 219lbs.=2.19 T. per A. 128lbs.=80 bus. per A.	(Plot 3.) Unmanured. 230lbs =2.30 T. per A. 152lbs.=95 bus. per A.	(Plot 4.) 30lbs.=600lbs.@$9 75 per A. Bone meal. 295lbs.=2.95 T. per A. 162lbs =101.25 bus. per A.

TABLE VIII.

Culture Experiments with fertilizers on wheat and oats, 1879-80. *Fourth series from the orchard, on the ridge. Kind, amount, and cost per acre of fertilizers used. Weight and rate per acre of product. Plots* 2 *rods by* $4=\frac{1}{20}$ *of an acre.*

WHEAT.		(Plot 1.)	(Plot 2.)	(Plot 3.)	(Plot 4.)
		25lbs.=500lbs@$10 50 per A. Dried meat.	Unmanured.	10lbs.=200lbs@$10 20 per A. Chili saltpetre. Sod. nitrate.	Unmanured.
	Straw	278lbs.=2.78 T. per A.	224lbs.=2.24 T. per A.	254lbs.=2.54 T. per A.	264lbs.=2.64 T. per A.
	Grain	138lbs.=46 bus. per A.	121lbs.=40.33 bus. per A.	135lbs.=45 bus. per A.	130lbs.=43.33 bus. per A.
		(Plot 1½.)	(Plot 2½.)	(Plot 3½.)	(Plot 4½.)
	Straw	238lbs.=2.38 T. per A.	225lbs.=2.25 T. per A.	248lbs.=2.48 T. per A.	279lbs.=2.79 T. per A.
	Grain	124.5lbs.=41.50 bus. per A.	116.5lbs.=38.83 bus. per A.	121.5lbs.=40.50 bus. per A.	125lbs.=41.66 bus. per A.
OATS.		(Plot 1½.)	(Plot 2½.)	(Plot 3½.)	(Plot 4½.)
	Straw	217lbs=2.17 T. per A.	198lbs.=1.98 T. per A.	180lbs.=1.80 T. per A.	195lbs.=1.95 T. per A.
	Grain	128lbs.=80 bus. per A.	130lbs.=81.25 bus. per A.	135lbs.=84.37 bus. per A.	94lbs.=58.75 bus. per A.
		(Plot 1.)	(Plot 2.)	(Plot 3.)	(Plot 4.)
		25lbs.=500lbs@$10 50 per A. Dried meat.	Unmanured.	10lbs.=200lbs@$10 20 per A. Chili saltpetre. Sod. nitrate.	Unmanured.
	Straw	270lbs.=2.70 T. per A.	192lbs.=1.92 T. per A.	215lbs.=2.15 T. per A.	206lbs.=2.06 T. per A.
	Grain	153.75lbs.=96.09 bus. per A.	117lbs.=73.12 bus. per A.	137.5lbs.=85.93 bus. per A.	103lbs.=64.37 bus. per A.

It has not been thought best to attempt to compute the pecuniary gain or loss, indicated as resulting from the use of fertilizers applied to this part of the grounds, until we shall have the data from one or two years following, when the effect of the summer-fallowing shall have worn off.

We may then expect a much more marked difference between the manured and the unmanured plots. The general excellence of the crops is certainly strong proof of the value of thorough pulverization of the soil. There are, however, some indications to be noted as confirmatory of our previous experience, or of the reputation elsewhere of the fertilizers used.

BONE MEAL.

The wheat plots dressed with bone meal, Nos. 3, in Table V, and 4, in Table VII, show a decided superiority over those adjoining them, and more yet over the general average. They are the highest that we have for the season, and in grain are equal, that is 48.33 bushels per acre. Of straw the first gave 3.30 tons per acre, and the second 3.71 tons. The effect of the bone meal on the oats on this ground is much less apparent. Although 101.25 bushels of grain, and 2.95 tons of straw per acre on Plot 4, Table VII, is the best crop of oats for the year, its indications are, to a certain extent, neutralized by Plot 3, Table V, which gives 70 bushels of oats and 1.98 tons of straw, only a medium yield compared with adjoining pieces.

LIME.

The apparently negative results from the application of lime are easily accounted for. As stated last year, the main effect of lime upon a clay soil is to produce a good mechanical condition, a fine division of particles, that is, good tilth. This is also one effect of summer-fallowing, and it is no wonder that the latter should have rendered the former superfluous.

GROUND DRIED MEAT.

The dressing of dried meat was donated by the manufacturer, Mr. A. Haas, of San Francisco. Its effect is apparent on wheat, Plots 5, Table V, and 1, Table VIII; but in neither case would this year's experience warrant its use. Of the oats treated in the same way, Plot 5, Table V, is rather below the average of its neighbors, while Plot 1, Table VIII, is decidedly above; so that here again the evidence is not conclusive. We shall watch, with interest, the behavior of these pieces the coming season. Perhaps the meat may prove better suited to other crops than to the small grains.

CHILI SALTPETRE. SOD. NITRATE.

This salt seems to have made some improvement in both of the wheat Plots 7, Table VI, and 3, Table VIII; but not to a sufficient degree to warrant its use, unless it holds over during the coming year, of which we are hopeful. On oats it has even less effect, as yet. At present its price its abnormally high, on account of the war in Peru.

All of these five series reported upon will be again sown in wheat and oats the coming season to secure further light on this important subject.

C. H. DWINELLE.

APPENDIX NO. 4.

I. SEED IMPORTED FROM HAAGE & SCHMIDT, ERFURT, GERMANY.

(A.) WHEATS.

Golden Drop, Blood Red, Paine's Defiance, Chiddam, Yellow Noé, Thuringian, North Allerton, Manchester, Square Sicilian. Spaulding's Prolific, Common March, Victoria, Emperor, Fern or April, California Spring, Improved Circassian, Cujavian, Hallet's Genealogical, Probsteier, Red Bearded, White Velvet, Egyptian or Miracle, White Flanders, Hungarian Mountain, Red Club or Hedgehog, Zealand, Smogge, Volo (Greek), Lausanne Nonette, Polish Wheat, Rye Wheat, Prince Albert, Petali (Greek), Bearded Missojen (Greek), Livadian (three-month), Unknown (name) failed, Atalanti (Greek), Theban (three-month) failed, Galland, White Flanders.

Spelts and Emmer.

Small-grained Spelt Wheat, or St. Peter's Corn (*Triticum monococcum*); Black Bearded Spelt (*Triticum Spelta*); Common White Bearded Spelt; White Emmer, Amel-Corn or March Spelt (*Triticum Amyleum*).

(B.) BARLEYS.

Chevalier, Kalina, Small Blue (smooth or naked), Guymalaye or Smooth Nampto, White Australian, Hallet's Pedigree Chevalier, Four-rowed Spring, Imperial (two-rowed), Earliest Black (two-rowed), Naked Nepaul (*Hordeum trifurcatum*), Black Spring, Scotch Annat, Large Naked Two-rowed, Six-rowed, Rice or Sprat (*Hordeum Zeocriton*), Erfurt, Thuringian, Four-rowed Winter, Six-rowed Black, Italian; Six-rowed Winter, Voightlander, Manchurian.

(C.) RYE.

Banat, Silesian, Alpine or Mountain, St. John's Day, Perennial Saxon, Perennial Champagne, Erfurt Prize, Giant Mountain, Large Roman, Hessian Body Guard, Large Russian, Hungarian, Swedish Sand.

(D.) OATS.

Thuringian, Hallet's Pedigree (White Canadian), Large Naked, Small Naked, Gray (from Houdan), Small Pied de Mouche or Fly Foot, Early August, Polish, Black Brie, White Flanders, Probsteier, Black Coulommiers, Early Georgia (Black Sea), Early Black Etampes, Hungarian, White Australian, White Bolognese, Scotch Hopetown, Siberian, Yellow Flanders, Late Silesian, Gray Winter, Yellow August, Black Tartar, Black Hungarian, Longfellow, Scotch Berwick, Brown Joanette.

II. BRENNER COLLECTION.

(A.) WHEATS.

Tunisian, Dinkel, Sicilian, Summer Hedgehog, Winter Hedgehog, Fourelle, White Llama, Golden Drop, Beardless Velvet, White Club (Bunch), Bearded Club, Big Long-bearded Club, Palestine, Brown-bearded, Bohemian, Whittington, White Glass, Velvet Club, Hungarian, Velvet Bearded, Frankenstein, Austrian, Short-bearded.

Spelts and Emmer.

White Silesian Spelt, Brown Spelt, Dinkel Spelt, Blue-bearded Spelt, Blue Club Spelt, Beardless Spelt, One-grained Spelt, Black Emmer, White Emmer, Red Emmer.

(B.) BARLEYS.

Smooth Blue (Hungary), Phœnix, Smooth Two-rowed, Smooth Four-rowed, Six-rowed, Palestine, Black (four-rowed) Winter, Four-rowed, Scotch Annat, English Chevalier.

III. FROM CLAUDE V. BURKE, YOLO COUNTY.

(A.) WHEATS.

Proper, White Sonora, Red Sonora, Black-bearded Maccaroni, Big White Club, Little Club, Defiance, Diamond, Clawson, Snowflake, Arnold's Victor, Hungarian, Mold's Red Winter, Patent Office, Archer's Prolific, Royal Australian, Red Chaff, Chile.

(B.) BARLEY.

Nepaul.

IV. MISCELLANEOUS GRAINS.

(A.) WHEATS.

Touzelle, from Mr. A. T. Hatch; Jonquil, from Oregon; Odessa (own raising, '79), original seed from Anaheim, Los Angeles County; Odessa, from Oregon; Red Sea; White Russian, from Willamette Valley; "Ghirka" (Odessa), direct importation by A. Gerberding; Taganrog, direct importation by A. Gerberding; Fultz, from St. Louis; Tangiers (maccaroni wheat), from the Island of Andros (Greek).

(B.) BARLEYS.

Smooth (naked) Blue, Black Two-rowed, Chevalier (seed of our raising—original seed from U. S. Department Agriculture), Scotch Two-rowed (seed of our raising—original seed from U. S. Department Agriculture, Carter's Prolific (seed of our raising), Peacock (seed from Erfurt), Nepaul or Bald.

APPENDIX No. 5.

REPORT OF MR. G. W. GLEE, GARDENER IN CHARGE OF THE AGRICULTURAL GROUNDS, ON EXPERIMENTAL CULTURE OF TREES OF ECONOMIC VALUE.

Professor E. W. Hilgard:

I hereby submit a short account of the most important trees and shrubs of economic value, either not mentioned in last year's report, or so young that very little could then be known in regard to their adaptation to the climate here.

CINCHONAS.

First and foremost must be mentioned the *Peruvian Bark Trees*, or *Cinchonas*, spoken of as being young seedlings in last year's report; for clearness sake I shall, however, review their history from the time the seed was received.

Five different kinds were donated by Sir William Robinson, of India, in March, 1879, viz.: *Cinchona Calisaya*, which yields the yellow bark; *C. Succirubra*, the source of the red bark; *C. Condaminea*, and *Officinalis*, supposed to furnish the Loxa bark, and a *hybrid*, probably originated in India. The seed was raised in India and appeared good and sound, though *succirubra* had a great deal of light seed mixed with it. The first sowing was made in April, in boxes kept in a house with bottom heat of 75° Fh., according to directions received from the donor. After about three weeks, the *Calisaya* and *hybrid* had sprouted, while the three other kinds remained dormant for five months, until removed to a cold frame, where an average temperature of 55° to 60° prevailed, and here quite a number of seeds germinated. A subsequent sowing in a cool frame with a similar temperature, gave a great many seedlings, which, together with those raised in boxes, were pricked into deep boxes, with good drainage, and removed to a house kept at about 60° Fh. in the daytime, and in the night just warm enough to prevent freezing. A few of each kind were, however, left in the cold frame, where they had been raised, and it is these to which you allude in your report last year, as having fared almost as well as those in the houses; a few of them actually survived the winter, but died in spring, the ground having become very compact by the very heavy rains. The first-grown plants of *Calisaya* and the *Hybrid*, which had been kept in a cool frame during the hot Summer months, were also removed to the house in the beginning of November.

During the winter about one fifth of the different kinds died, except of *Succirubra*, but the remainder, though by no means very vigorous, looked comparatively healthy. When the rain ceased our supply of rain water (with which they had been watered) soon gave out, and after a month or two a number of plants commenced to turn yellow, and the roots to get black. It has only been by the most careful treatment, by giving an extra amount of drainage, that we have succeeded in bringing so many through the dry season. The *Calisaya* and *Succirubra* appeared to resist better the influences of the spring water (to which we naturally attributed the ailment), probably by their more robust growth and stronger power of assimilation, due to the large leaves.

In May, 1880, the first plants were set out in the Garden of Economic Plants, where the most protected nook was selected for them; this is a slope towards the south, partly shaded by an old live oak, as it was claimed that some shade would be beneficial during their infancy. After a month, however, it was found that those specimens most exposed to the sun, flourished best, and another little batch was planted in the garden in the middle of June, this time in a spot where they were exposed to the full noonday sun. The size of these plants was, as those before, about four inches. Of these, all the perfectly healthy plants, with leaves of a deep green shade, received no set-back whatever; but on the contrary, after the lapse of a month, increased greatly in size and vigor. Especially was this the case with a fine specimen of *Calisaya*, that in October, four months after its transplanting, had reached a height of nearly two feet. As has been stated before, the *Calisaya* is a stronger grower than the rest, its large leaves, no doubt, giving it some advantage. On the whole, its habit is that of a large-growing tree, which it is said to become in its native home. The other varieties grew in proportion, but the less robust individuals received a check by having the youngest leaves scorched or crisped, but after awhile they also recovered, and showed all signs of a healthy growth. The various kinds have retained the peculiar habits of the young seedlings, the *Officinalis* and *Condaminea* being very slender, while the *Hybrid* partakes of the habit of all of them, making it very difficult to say which it resembles the most.

The first frost of any consequence to which these cinchona trees were exposed, occurred on the night between the 14th and 15th of November last, the thermometer reading 28° F. at 6:40 A. M. The weather was, however, very dry, and only a single individual of the hybrid was hurt, none of the others showing any signs of injury whatever. A few days later a terrible gale from the north damaged the leaves badly, and it was deemed advisable to shelter them partly. A grain sack was tacked on stakes all around each, leaving it open above; notwithstanding this protection, two frosty nights following after the rain injured the most luxuriant specimen of *Calisaya* and the *Hybrid*, while none of the others were hurt, and have remained untouched up to this day.

While it is impossible to foretell how these young trees will go through the winter, it seems evident that there must exist localities in California with winters warm enough for the three more hardy kinds—*Succirubra Officinalis* and *Condaminea*, and then we have still, as you remarked in the last year's report, untried, the *Cinchona Pitayensis*, that bears the reputation of being the hardiest of all.

It should be added that the cinchonas do not seem to require that great amount of moisture said to prevail in their native home, for a successful growth; at least during four months they were only watered five times, and six weeks elapsed from the last irrigation to the first rain, and during this period dry and hot winds were prevalent.

It has been stated before, that considerable trouble was experienced in raising the various kinds of cinchonas from the seed, owing partly to the slow growth of the young seedlings, which allowed a thick green layer of moss to surround the little plants long before the roots had filled the pot; and also to their extreme sensibility even after they had reached considerable size. This led us naturally to try the propagation by cuttings as the more convenient, and quicker for increase. It was found that nearly every healthy little shoot would grow, and that from three to six weeks was sufficient to root any soft-wooded cutting placed in a common propagating box covered with glass, and placed in a greenhouse with a very uneven temperature, varying from as high as 90° F. in the day to 50° and below in the night. This having been ascertained, it became at once clear that this mode of propagation would be the most desirable, as the cuttings are not alone three or four months ahead of the seedlings, but also naturally retain the hardiness of the mother plant.

In consequence of this experience, there has now been prepared a well-drained bed, where a steady, mild bottom heat will be kept up, to receive as many cuttings as can be obtained from the young seedlings; and we hope thus to be able to increase the stock considerably before spring. With this view, also, it may be desirable to postpone for a time the distribution of the young trees for trial in different parts of the State.

The Carob Tree (*Ceratonia siliqua*).—This seems quite hardy in this region, as young seedlings resisted the frost of last year. It is, however, a very slow grower the first season, until it becomes thoroughly established; after which it is comparatively rapid. A young tree, with the best of care, has only made about ten inches of growth during the whole season.

The Caper Bush (*Capparis spinosa*).—Seed of this shrub was procured from New York, but only two plants were raised from this; they were, however, increased by cuttings, that grew quicker than the seedlings. In the garden this has been of very slow growth, but until now is unaffected by the frost.

The Date Palm (*Phœnix dactylifera*)—Is, even as a young seedling, perfectly hardy here; but, as most palms, a very slow grower the first years.

The Japan Vegetable Wax (*Rhus Succedanea*).—A Japanese tree, belonging to the Sumach tribe. Yields from the coating of the seed a substance similar to beeswax. The tree has been found to be a free grower here, making shoots several feet in length during the season, and is quite ornamental, resembling the Staghorn Sumach. *Rhus Vernicifera* yields the genuine Japan varnish. It is a tree of similar habit as the Vegetable Wax. It has, though planted late, made a very fine growth. Both are deciduous, and perfectly hardy.

The Pear-shaped Guava (*Psidium pyriferum*).—This bush has not withstood the frost in Garden of Economic Plants, but older plants have survived near the propagation houses. It requires, doubtless, protection the first year.

Macadamia ternata—Is a Queensland tree, that produces a very finely flavored nut. It is a near relation of the *Grevillia robusta*, known as "Australian Fern Tree"—a very ornamental tree of our gardens—but its leaf resembles more a holly. This tree is, doubtless, also perfectly hardy, but is a slow grower during its first years. It was grown from seeds.

Zizyphus vulgaris, and *Jujuba.*—Two species, furnishing the jujube paste, are both growing luxuriantly here. The first has fruited in Sonoma, but has not answered expectations. The latter may probably be superior.

Anona Chirimoya or *Custard Apple.*—This delicious fruit belongs really to the tropics, but may possibly find sheltered localities where it will do well. It was killed last season, in the garden. Another tree, planted this year, appears better prepared to resist the frost, the wood being well ripened. It is quite a rapid grower, making shoots two to three feet in a season outdoors, and twice that in the greenhouse. It is raised easily from seeds, but seems to be difficult to propagate from cuttings.

Anona muricata, The Sour Sop.—There is still less probability of rearing this tropical fruit outdoors. Two plants set out in the garden at the same time as the Chirimoya, died very soon after, and it has never made much growth even in the warmest place in the greenhouse.

Anona or *Asimina triloba.—The Papaw* of the Eastern States, and the representative of the Custard Apples there, has shown itself rather delicate in transplanting, but some plants have done comparatively well, and have reached about the height of a foot in two seasons.

The Tamarind (*Tamarindus indica*).—This tree seems very slow here. It has never progressed outdoors, and seems almost equally slow indoors.

The Japanese Persimmon (*Diospyros Kaki*).—This fruit, which seems destined to become of considerable importance to California, has ripened fruit in Berkeley, but of small size compared with specimens from Japan, and rather astringent. The variety, however, is doubtless of inferior quality, having been introduced three or four years ago, when the great difference of the varieties was not so well known. There is now on hand an assortment of twenty of the best varieties, yet, however, in the nursery. The persimmon is of moderate growth here, and the failure of a good many people, especially in this neighborhood, to make their trees grow, is probably only due to an omission to get their soil deeply worked, as the taproot of persimmon is evidently intended to penetrate very deeply into the ground. The earth in the holes ought to be loosened two or three feet deep.

The Japanese Chestnut.—The nut of this seems almost to surpass the largest Italian. Young seedlings have grown rapidly in well cultivated soil, reaching in one season two and one half feet.

The above includes all trees and shrubs of any importance in economic respects, outside of timber and ornamental trees, which have been tried during the last year out of doors. There now remains to be mentioned a number of plants which have been too tender to expose to the weather, and require either permanent shelter in the greenhouse, or, at least, during their infancy, in this locality.

Carica Papaya, or *Melon Tree*, also called *Papaw*, is said to be hardy in South France; *Grevillea annulata*, a tree likewise valuable for its fruit, a well flavored nut, like the *Macadamia* mentioned before; *Argania sideroxylon*, a tree, native of North Africa, where its fruit is said to furnish cattle feed, and the wood the hardest of timber; *Berberis heteropoda*, an edible *Barberry*, from Turkistan; *Bixa Orellana*, the *Annato Diospyros*; *lotus*, the *European Persimmon*; *Coffee*, *Banana*, and *Vanilla*. As these grow, and are tried in the open ground, they will be reported upon.

Appendix No. 6.

LIST OF DONATIONS OF SEEDS AND PLANTS RECEIVED DURING 1880.

From Mr. Horace J. Smith, Philadelphia:

December, 1879.—Acorns of *Quercus Macrocarpa,* Overcup Oak.

From Mr. Steve Nolan:

December, 1879.—Seed of *Leptosyne maritima.*
November, 1880.—Plants of *Buddleya floribunda,* a new *Hydrangea sp.;* cuttings of *Salvias.*

From Mr. Robert E. C. Stearns, Berkeley:

December, 1879.—Seed of the common Medlar.

From J. Gill, San Pablo Avenue:

December, 1879.—Cuttings of two *Podocarpus sp.; Hibiscus.*

From Mr. A. Gerberding, San Francisco:

January, 1880.—Odessa Wheat from Anaheim, Los Angeles County; White Wheat raised by Indians in Arizona; Red Sea Wheat—sample from F. A. Reus, St. Louis, Missouri; Fultz Wheat—sample from F. A. Reus, St. Louis, Missouri; White Russian, from Willamette Valley, Oregon.

February, 1880.—Odessa, "Ghirka Wheat," direct importation; Odessa, Taganrog Wheat, direct importation.

September, 1870.—White Russian Wheat grown in Ventura County; Odessa Wheat from Anaheim; Bearded White Chaff, Odessa Wheat, grown in Ventura County, from imported seeds.

From Hatch & Barclay, San Francisco:

January, 1880.—Odessa Wheat, raised in Oregon from imported seed; sample of Oregon shipping Wheat.

From Groves & Co., Shellmound Park, Oakland:

January, 1880.—Plant of *Van Volexima Taxoniensis.*

From Mr. Ed. Wolleb, Fruit Vale:

January, 1880.—Wheat from the Island of Andros (from Paris Exposition.)

From Mr. E. J. Wickson, Berkeley:

January, 1880.—Tobacco seed from J. Oswald, Martinville, Grant County, Wisconsin; Latakia (from Turkey); New Persian; Novara, from China.

April, 1880.—Seeds of Neosho Grapevine (*Vitis aestivalis*), received from Phil. Pfeifer, Sedalia, Missouri; seeds of Beggar Ticks (*Bidens leucantha*).

July, 1880.—White Indian Club Wheat, grown in Queensland; Red Indian Wheat, grown in Queensland, said to be rust proof; Defiance Wheat, grown in San Joaquin County.

From Mr. G. P. Rixford, San Francisco Bulletin:

March, 1880.—Imported French Preparturiens, Walnuts; Blunt's Prolific Corn.

April, 1880.—Seed of Carob tree, *Ceratonia siliqua.*

August, 1880.—Chile seeds: Aquillai (*Quillaya saponaria* or Spanish Bark); Bayoto, Baldo, Maiten, Peumo, Espino (Mimosa Caveni), White Palque, Linque, Culen, Angol Peach, Buingan Pear, Unknown Evergreen Tree, Canchalagua, Chirimoya de Coquimbo.

From Captain Robert Simpson per A. T. Dewey:

February, 1880.—Seeds of Wild Rice (*Zizania aquatica*).

From Mr. S. T. Howell, Merced:

February, 1880.—Smooth Blue Barley.

From H. H. Berger & Co., San Francisco:

March, 1880.—Pueraria sp., a starch-yielding plant of Japan.

From Mr. John T. Doyle, of Menlo Park:

April, 1880.—Seven varieties of Olive seed; seeds of: Eastern Wild Cherry (*Cerasus Serotina*); *Areca rubra, Poinciana sp. (pink); Algaroba;* Golden Tree, Golden Shower, *Adenanthera pavonina, Catharthocarpus sp., Catharthocarpus javanicus,* Melia sp. (Paradise tree), *Bauhinia glauca, Allamanda cathartica, Tecoma Velutina,* Mexican Creeper, *Agstasia-chelubes.*

From Dr. Phil. F. M. Poulsen, of Copenhagen, Denmark, per W. G. Klee, Berkeley:

Seeds of thirteen species of *Rosa* (Rose); seeds of ten species of *Crataegus* (Thorn); seeds of nine species of *Cotoneaster*; seeds of seven species of *Ribes* (Currant, Gooseberry); seeds of eight species of *Sorbus* (Mountain Ash); seeds of *Aronia floribunda, Rhodotypos kerrioidès, Clematis campaniflora.*

From Mr. Charles C. Dwinelle, Berkeley:

April, 1880.—Seeds of Carob Tree (*Ceratonia siliqua*); seed of a Sandwich Island shrub, from Mr. J. Maillard.

From Mr. L. J. Fish, Martinez, Contra Costa County:

April, 1880.—Wheat (Maccaroni), from Tangiers, Morocco, North Africa.

From Mr. H. P. Flint, Hueneme, Ventura County:

April, 1880.—Seed of Schraders Brome Grass; seed of Guinea Grass.

From Mr. W. A. Sanders, Kingsburg, Fresno County:

April, 1880.—Seeds of Whippoorwill, Cowpeas (*Dolichos sinensis*); seeds of mixed *Dolichos;* seeds of Madder (*Rubia tinctoria*); seeds of Indigo (*Indigofera tinctoria*); seeds of Jute (*Corchorus textelis*); seeds of Seradella (*Ornithopus satavus*); seeds of Ramie (*Urtica nivea*).

From Hon. B. B. Redding:

July, 1880.—Seed of Bladdernut Tree (*Staphylea Bolanderi*).

From Mr. J. G. Lemmon:

July, 1880.—Seed of Bladdernut Tree.

From Mr. Leonard Coates, Magnolia Farm Nursery, Napa County:

July, 1880.—New Zealand seeds of: *Linum monogynum, Coriaria ruscifolia, Pomaderris apetala, Parsonia albiflora, Gahnia ebenocarpus, Podocarpus spicata, Van Volexima Taxonia, Pittosporum tenuifolium, Areca sapoda, Anthropordium cirrhatum, Dactylis caespitosa.*

From David Tisch, florist, Seventh street, Oakland:

July, 1880.—*Bouvardia Davidsonii, Fuchsia procumbens, Begonia coccinea.*

From H. K. Harmon, of Oakland:

August, 1880.—Plants of *Adiantum Farleyense, Adiantum magnificum;* cuttings of *Torenia asiatica;* various varieties of *Begonia Rex*; *Begonia smaragdina; Allamanda* Schottii; Ixora coccinea; Bouvardia Vrelandii; various Coleus; Fittonia Verschafeltio.

From Mr. J. M. Hutchings, of Yosemite Valley:

September, 1880.—Seeds of Yucca baccata; Yucca Whippley; Pinus toreyana; Pinus sabiniana; Pinus coulterii; Purple calochortus, sp.

From Mr. Wilfred Page, San Francisco:

September, 1880.—Taganrog Wheat, grown in San Francisco from imported seed.

From W. H. Mills, editor of Record-Union, Sacramento:

September, 1880.—Michigan mixed wheat, in heads.

From General John Bidwell, Chico, Butte County:

September, 1880.—Grains from Rancho Chico: Rye; White Holstein Oats; Barley, both Irish and Mexican; eighteen varieties of Wheat, as follows: Australian Blue Stem, New Prolific, Pride of Butte, White Club, Italian Maccaroni, Silver Chaff, Winter Gold Dust, Australian, Champlain, Defiance, White Chili, Red Nameless, Odessa, Genesee, Tuscan, Proper, White California, Mold's Red Winter; Indian Corn, Wilson's Yellow, and Runner's White Dent; White Egyptian Corn or Doura; German Prunes, cured in patent dry house.

From Mr. R. G. Dean, Brentwood, Contra Costa County:

September, 1880.—Wills' Club, and other wheats.

From Dr. Herman Behr, San Francisco:

May, 1880.—Seeds of *Grevillea annulata* (eatable nut); *Atriplex vesiearium,* shrub of the salt steppes of Australia.

October, 1880.—Seed of Red Peruvian Bark Tree (*Cinchona succirubra*).

From Mr. W. W. B. Stevens, of the Sophomore Class:

October, 1880.—Various acorns and pine cones; seed of the Sierra Plum (*Prunus subcordata*).

From Mr. W. Ashby, Berkeley:

October, 1880.—Plants of the following species of ferns: 2 *Gymnogramme tartarica;* 2 *Platyloma rotundifolia; Platyloma falcata;* 2 *Pteris tremula;* 1 *Pteris geranifolia;* 1 *Pteris longifolia;* 2 *Pteris erctiea;* 2 *Pteris serrulata;* 2 *Pteris adiantoides;* 2 *Adiantum colpodes*; 2 *Adiantum diaphanum;* 2 *Adiantum euneatum;* 1 *Adiantum pedatum;* 1 *Diplazium pubescens*; 1 *Asplenium diversifolium;* 1 *Nipholobus sp.;* 1 *Blechnum brasiliense;* also 3 species of *Lycopodium.*

From Mrs. Christian Bagge, Oakland:

Plants of *Hoya bella; Passiflora kermesina; Begonia discolor.*

From Mr. Conrad Hornung, San Francisco:

October, 1880.—Plants of the following species of Ferns: *Diplazium elegans; Adiantum colpodes; Dicksonia sp.; Dawallia Moorcana; Aspidium spinulosum: Maranta zebrina.*

From Mrs. R. M. Austin, Plumas County, per Mr. C. Hornung, of San Francisco:

November, 1880.—Plants of *Darlingtonia Californica; Penstemon Menziesii; Corydalis Cascana; Gentiana calycosa; Cryptogramme acrostichoide; Pellœa densa; Pellœa brachyptera; Aspidium nevadense.*

From Mr. E. R. Young, Blue Lake, Lake County:

November, 1880—Acorns of Golden Oak (large live oak), *Quercus chrysolepis;* Dwarf Oak (chemise oak), Quercus dumosa; Chestnut Oak (tanbark oak), Quercus densiflora; Black Oak (black bur oak), Quercus Kellogii; Dwarf Oak (chemise oak); White Oak (white water oak). Quercus lobata; Garry's Oak (white post oak), Quercus Garryana; seed of Wild Maple.

From Mr. C. H. Denison, Oakland:

November, 1880.—Various Arizona flower seeds.

From Mr. George Batts, Brownville, Yuba County:

November, 1880—Seed of California White Ash; Yellow Pine; Red Cedar Sugar Pine; tubers of a seedling Potato, named Batt's Acme.

APPENDIX NO. 7.

ANALYSES OF THE ASH OF TWO CALIFORNIA WHEATS.

GRADUATING THESIS OF MR. G. E. COLBY, OF THE CLASS OF 1880,
COLLEGE OF AGRICULTURE, UNIVERSITY OF CALIFORNIA.

California has, for a number of years, been noted for her great yield of wheat. She now stands amongst the first of wheat producing regions, not only of the United States, but of the world. The cultivation of wheat in this State has been marked by a rapid increase. In 1869 the wheat crop amounted to 10,006,021 centals; ten years later, 1879, the wheat crop reached 22,400,000 centals, of which 12,074,997 centals were exported.

Among the wheat districts with which California competes, that of the Red River of the north, in Minnesota, is becoming of great importance. There grain is cultivated by individuals and companies who are favored by "special railroad rates," which enable them to market their grain cheaply. According to statistics, the average yield is no greater there than here. The country is, however, subject to floods, which carry away everything. Russia also has been a large wheat producing country, exporting its surplus to England. But now the wheat from Lower Russia is objected to on account of its inferior and damaged condition when placed in the English market, where it is already undersold by American Western wheats. The market for the surplus wheat of California is England and western Europe, and this determines the price of California wheat. In the English market California wheat brings a higher price than European wheats, on account of its hardness, whiteness, and general good milling qualities. By mixing the soft European wheat with California wheat, a fine quality of flour is produced. The standard California wheat, in Liverpool, is the White Club; but several hard, white varieties are sold under this general name. White wheats have, as a consequence, been very largely grown in this State, and in many cases where other varieties would have proved profitable, had other considerations been taken into account. For instance, in a wheat district so large as California's, with its varying climates, we find that wheat that is adapted to one locality, might be entirely unfit for another. As a consequence, the number of varieties of wheat grown must increase. Again, in one locality rust may affect certain wheats, and varieties not subject to rust are desirable there. The requirements of the local demand must also be considered. Certain wheats may be qualified to produce some largely consumed article of food; for instance, now that the demand for "cracked wheat" is large, a wheat of such character and quality as the white Sonora, a typical cracking wheat, is desirable; as another instance, maccaroni wheat may be mentioned.

It is in large demand for making maccaroni to supply the Italian population.

Believing it to be desirable that the chemical peculiarities of some of the principal varieties of wheat grown in California should be ascertained, the present investigation was undertaken.

The two wheats selected were the Odessa and the White Sonora. The Odessa is highly recommended as being a wheat that will withstand rust. White Sonora is an excellent variety for making "cracked wheat," or "wheaten grits." The Odessa, so called, was first introduced into California in Los Angeles County, where it has proved to be all that is claimed for it. The wheat that is called Odessa in this State, is known in trade as "Ghirka," and is not one of the Taganrog wheats.

Both the Ghirka and Taganrog districts are in southern Russia, near Odessa. The yield of "Ghirka" wheat in this State, especially in the southern part, is very good, and, in many places, above the average. So much has been written in agricultural papers about the rust-resisting character of this wheat, has rendered the demand for it for seed so high this Winter (1879–80), that it has sold for $0.06 and $0.07 per ℔ in the San Francisco market. Lately a shipment of this wheat was received in San Francisco, directly from Odessa, Russia, so that the crop of 1880 is expected to be large, and the wheat being more generally tried, it will be better tested. The wheat that has been raised here is of such quality that, if it is cultivated in sufficient quantity, and sold at milling rates, millers will use it in preference to white wheats. At present the only reason for not milling this grain is that white wheats are more available. After the demand for seed is supplied, it will undoubtedly be cultivated in quantities for milling. This wheat is rich in *gluten*, or flesh-forming ingredients, hard, and gives a white grade of flour. The best flour in the United States, made in Minnesota, is from wheat of even darker color than the Odessa, or "Ghirka," grown here. Odessa wheat has been tried in Minnesota, and, although it *rusted* somewhat, it was harder than other wheats grown there at the same time. This hardness will make the California "Odessa" profitable in the English market, when it is cultivated extensively enough to furnish a surplus for exportation.

The sample used for analysis was grown in 1879, from seed grown at Anaheim, Los Angeles County, and exhibited in the Mechanics' Fair. The grain was grown in the experimental garden of the University of California, in a small plot, where it fully bore out its reputation for resisting rust. Only a few stalks were rusty, and those not enough to injure them; while other varieties of wheat in the same garden were badly rusted, and some entirely ruined. The heads were medium in length, with a few short beards at the upper extremity. As they approached maturity, they assumed a bronze color, and many of the stems and leaves turned purplish. The berry was medium in size, light red color, hard, but did not have a glassy appearance.

The white Sonora wheat is supposed to have come from the State of Sonora, Mexico. This wheat closely resembles, if it is not identical with, a specimen of wheat in the University collection, labeled "Seed Wheat," which was raised by Indians in Arizona.* White Sonora wheat has been cultivated in various portions of this State. In Los Angeles County it yielded a plump, white, good milling grain, which did not rust on an adobe soil, although on a light soil it did so. The grain is not thrashed out by winds, standing "northers" very well. The head is slender, of middling length, much like Eastern wheats, but not at all like the White Club wheats.

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*Since the above was written, a crop raised from the Arizona seed shows it to be identical with the common Red Chaff Sonora of this State.

The sample analyzed came from Lemoore, Tulare County, where the climate is particularly suited for the production of a light colored, hard wheat. The heads were beardless, or nearly so. The berry was short, plump, remarkably light colored, quite hard, and, in fact, was a typical "cracking wheat."

The following is an outline of the analysis, which consists of two parts: first, the preparation of the ash; second, the analysis of the ash. The ash was prepared according to the method used by Professor Hilgard in his laboratory. About one hundred grammes of wheat was pulverized and thoroughly carbonized at as low temperature as possible. The carbonized residue was then leached with hot water to dissolve out the more volatile parts of the ash; as chlorides and sulphates of the alkalies (soda and potash). The residue was again carbonized and again leached as before—this operation being continued until a white residue remained. By this method were obtained a portion *soluble* in water, and a portion insoluble in water. These were separately analyzed according to the usual methods.

Below are the results of the analysis of the soluble and insoluble parts of the ash, from which have been calculated the percentages of each constituent of the whole ash of both wheats:

Results for White Sonora.				Results for Odessa.			
Soluble.		Insoluble.		Soluble.		Insoluble.	
K_2o	49.44	$Mg0$	20.097	K_2o	42.78	Mgo	21.75
Na_2o	3.09	$Ca0$	6.538	Na_2o	20.29	Cao	9.205
P_2o_5	40.80	Mn_30_4	.355	P_2o_5	30.76	Mn_3o_4	.360
Cl	3.64	Fe_20_3	7.229	Cl	3.52	Fe_2o_3	4.512
So_3	2.84	P_20_5	62.935	So_3	3.32	P_2o_5	58.875
		$Si0_2$	2.429			Sio_2	4.56
		$S0_3$	.284			So_3	.428
Total	99.81	Total	99.867	Total	100.67	Total	99.70

Total Ash of White Sonora.		Total Ash of Odessa.	
K_2o	24.392	K_2o	20.760
Na_2o	1.526	Na_2o	9.846
Cao	3.316	Cao	4.736
Mgo	10.176	Mgo	11.192
Mn_3o_4	.179	Mn_3o_4	.184
Fe_2o_3	3.651	Fe_2o_3	2.321
Sio_2	1.228	Sio_2	2.346
P_2o_5	51.993	P_2o_5	45.221
Cl	1.798	Cl	1.710
So_3	1.548	So_3	1.830
Total	99.803	Total	100.146

A comparison of these analyses shows that they do not differ in any very marked degree, and in many cases there is quite a similarity. Still, in the results of all such analyses there are differences, sometimes large, and sometimes small, which may partly be due to analytical error, and partly produced by the varying circumstances under which the crop grew. Soil and climate are the factors which, most of all, produce these differences. The following table shows the composition of the ash of wheat grain, according to recent analyses:

Per ct. of Ash.	Potash.	Soda.	Magnesia.	Lime.	Peroxide of Iron.	Phosphoric Acid	Sulphuric Acid.	Silica.	Chlorine.	Br Ox. Manganese.		
------	31.3	3.2	12.3	3.2	0.0	46.1	0.0	1.9	----------	----------	Average of 79 analyses.	
1.9	31.4	3.2	12.3	3.5	0.8	45.0	0.5	3.00	0.4	----------	Average of 26 analyses by Way & Ogsten.	
2.0	33.7	2.6	12.7	3.3	0.0	44.5	0.0	0.8	----------	----------	Average of 30 analyses by Von Bibra.	
1.6	20.0	0.0	6.3	0.9	0.0	34.4	0.0	0.0	----------	----------	Lowest per cent. in 79 analyses.	
3.1	38.4	15.9	16.3	8.2	3.3	60.4	2.4	7.6	6.1	----------	Highest per cent. in 79 analyses.	
											Locality of Plant.	*Analyst.*
1.51	33.00	2.07	13.99	2.82	0.0	46.18	.48	1.42	----------	----------	England	Way & Ogston.
1.63	29.92	6.08	12.43	1.83	1.76	45.30	.59	4.43	.64	----------	England	Way & Ogston.
1.63	32.05	3.38	9.32	4.43	1.35	47.33	0.0	3.05	----------	----------	England	Way & Ogston.
1.73	26.7	2.12	12.76	6.78	2.32	46.99	.24	2.05	----------	----------	England	Way & Ogston.
1.84	34.26	4.53	9.56	3.21	2.06	40.57	.32	5.46	----------	----------	England	Way & Ogston.
									So_3 and Fe_2O_3, etc.			
2.27	29.16	4.43	7.82	4.56	----------	49.57	0.0	.82	1.73	----------	Russia	Von Bibra.
1.88	33.92	1.70	9.11	2.50	----------	42 08	0.0	.77	2.92	----------	Egypt	Von Bibra.
2.00	36.48	1.38	15.37	1.07	----------	49.25	0.0	.80	2.00	----------	Spain	Von Bibra.
1.40	35.38	4.00	12.93	5.72	----------	39.25	0.0	.80	1.92	----------	Germany	Von Bibra.
2.16	27.74	.75	9.73	4.28	----------	47.97	0.0	.57	2.87	----------	Algiers	Von Bibra.
									Chlorine.			
1.54	20.76	9.85	11.19	4.74	2.32	45.22	1.83	2.346	1.71	.184	California	Colby.
1.81	24.39	1.53	10.18	3.32	3.65	51.99	1.55	1.23	1.798	.179	California	Colby.

The first five analyses show how much wheat grain varies in its composition. The next five are analyses of English wheats; the data were obtained from Muspratt's chemistry. The succeeding five are from different countries, and analyzed by Von Bibra. The last two are respectively the Odessa and white Sonora, analyzed by me. A comparison of my analyses with the others of the table shows the following differences:

First—The *potash* in both my analyses is lower than the average of the others mentioned.

Second—The *soda* in the white Sonora is below the average, while that of the Odessa is very much above the average.

Third—The *lime* and *magnesia* agree quite closely with other analyses.

Fourth—The percentage of *peroxide of iron* is quite variable in all the analyses, but that in mine agrees closely with that of the analyses of English wheats.

Fifth—The *phosphoric acid* in the Odessa is very near the average; that of the white Sonora is five per cent. *above* the average.

Sixth—The percentage of *sulphuric acid* and *chlorine* of both the white Sonora and Odessa is much higher than that in the other analyses where sulphuric acid and chlorine are mentioned at all. Where they are spoken of they are marked as low, for the reason that they were partially dissipated in the combustion of the ash. My results being higher for both these ingredients would only add to the merits of the method which was followed in the preparation of the ash.

Seventh—The *silica*, as compared with the English wheats, is low, but compared with Von Bibra's results, it is high.

Eighth—*Manganese* is not mentioned in any of the analyses I have seen. In both my results it appears.

From this brief comparison it seems that these California wheats are rather deficient in *alkalies*, medium in *phosphoric acid*, and in sulphuric acid and chlorine, much above the average. The researches in this subject are, of course, by no means exhausted by this investigation. Much remains to be learned as regards the proximate constituents of California wheats. It was the purpose of this investigation to study these constituents and determine them, but for lack of time they were deferred for further study.

VITICULTURAL APPENDICES.

APPENDIX NO. 8.

VITICULTURAL DEPARTMENT.

President John Le Conte, University of California:

I herewith submit a report of progress made, and work done, under the provisions of the "Act for the promotion of the viticultural industries of the State" at the last session of the Legislature.

I. INVESTIGATIONS CONCERNING THE PHYLLOXERA.

Under the above Act, making provision for experimental and other researches on subjects related to viticulture, under the direction of the Professor of Agriculture of the University, Mr. F. W. Morse, heretofore Chemical Assistant in the general Agricultural Laboratory, was in August last transferred to this department of investigation. He, with myself, attended the meeting called by the Committee on the Phylloxera, appointed by the State Board of Viticulture, at Sonoma, August 23d and 24th. At a meeting of that committee, held subsequently, Mr. Charles A. Wetmore, and myself, were appointed a sub-committee to select and direct a proper person, who was to determine, by examination in the field, the actual area so far invaded by the Phylloxera; the expense of such exploration to be defrayed, half and half, out of the funds of the Viticultural Commission and that appropriated to the University for such purposes. Upon the approval of this arrangement by the Committee on Viticultural Matters, appointed by the Board of Regents, we selected Mr. Morse, above referred to, as a suitable person for the field exploration to determine the actual spread of the phylloxera. In this selection we were governed, not by the consideration of any intimate acquaintance with general viticulture on the part of Mr. Morse, but simply by that of sending out a reliable observer of facts, who should be altogether free from any bias or preconceived ideas on the subject. The maximum time available for this investigation being about six weeks, it was not possible to carry it very far into detail on the extensive territory to be covered; the object being rather to obtain a general idea of the extent of the invasion, than a detailed outline of the field.

The general result of Mr. Morse's explorations has already become a matter of public notoriety. It was found that the rumors of the existence of the plague at many points outside of the Sonoma Valley, that had heretofore received but little credence, were but too well founded, and that while its presence has not as yet been demonstrated at any point of the valley lying south of the Sacramento and American Rivers, its northern limit passes from the head of Sonoma Valley proper, to Yountville in the Napa Valley, and thence northeastward to the neighborhood of Lincoln, Placer County. Its presence in the foothills further north is suspected, but not demonstrated; but it was found in force near Placerville, El Dorado County. From all these points, Mr. Morse sent well bottled samples of infested roots, for verification.

In the broad band running across the State, as above defined, the invasion is of a general character, though not universal. In the Counties of Solano and Yolo, it seems to have spread from several independent centers, and there is some reason to suppose that its existence there antedates, at one or two points, even the invasion of the Sonoma Valley.

The detailed report of Mr. Morse is subjoined. (See Appendix No. 9.) In regard to the measures recommended for the prevention and repression of the invasion, I respectfully refer to Supplement No. 1 to the report of the Regents, the printing and distribution of which has been hastened as much as possible, for the obvious reason that the season for action against the insect is at hand, and whatever is to be done must be done quickly, and should be done intelligently. I have only to add that the reports received since the paper referred to went to press, from the Phylloxera conventions held at various points in Europe, have but served to confirm the opinions and recommendations laid down in my last publication; substantially to the effect that of insecticide measures, submersion and the use of bi-sulphide of carbon are alone practically successful thus far; and that grafting the European grape varieties on resistant American stocks, is the great preventive to be universally recommended for the vineyards to be hereafter established in infested districts, if not everywhere in the State.

I am pleased to be able to say that there is a near prospect of having the important vermin destroyer, the bi-sulphide of carbon, made accessible to the farming community at such reasonable rates as will render it available, not only for use against the Phylloxera, but also against the ground squirrel, as recommended by me in a publication issued from the University press some years ago; as well as against other insect and domestic pests, the number of which is so alarmingly on the increase in this State. Of the efficacy of this substance for the purposes mentioned, the experience had can leave no possible doubt; but its price in this market (from forty-five to sixty cents per pound), has thus far prevented its use on the large scale, except where, as on the agricultural grounds of the University, radical measures, regardless of expense, were called for. In the expectation that such measures will, before long, have to be taken against the phylloxera, Mr. John H. Wheeler, a graduate of the University, (class of 1879), and who is personally interested in the preservation of the vineyards of Napa Valley, is now erecting works for the manufacture of the carbon bi-sulphide, on the bay shore, near West Berkeley, and hopes to be able to supply any demand for the insecticide that may arise in view of late developments, at a price greatly below that at which the material could be brought here from the East, and compatible with its general employment in the repression, or stamping out, of the Phylloxera.

Several years ago, in a lecture delivered at the town of Sonoma, I urged the immediate making of experiments concerning the Phylloxera resisting qualities of the native Californian vine, so abundant along our watercourses; whose botanical affinities seem to be closest with the "Cordifolia," or frost grape, the cultivated varieties of which have proved so hardy against the attacks of the insect. Experience had since with the wild grape, in localities where the Phylloxera was rampant, appear to have fully confirmed this expectation. During the last two years Mr. Charles H. Wetmore (now a member of the Viticultural Commission) has taken great interest in this question, among many others relating to viticulture. He urges that the use of seedling vines, instead of those propagated from cuttings, would secure stronger and longer-lived stocks, and that in the case of the California wild grape, at least, little if any time would be lost when it is intended to use the seedlings as stock for grafting. Experimental sowings made on the University grounds, with seed from Lake County, kindly furnished by Mr. Wetmore, seem to confirm fully this expectation. The plants from seeds sown in March last, are large and stout enough to be grafted upon this winter; and a number of such grafts, of each of the chiefly valuable grape varieties grown in the State, will be made upon them. A number of them also will be available for distribution to such parties as may desire to experiment upon them in different sections of the State. So far as the evidence goes, it is probable that the wild stock will prove quite as rapid a grower as any of the cultivated varieties, and will thus, as a stock, not be liable to the objection prematurely urged by some, that it will remain behind the graft in the thickening of the trunk. Experiments now under way will, however, peremptorily settle this question within the next few years. Should the "*Vitis Californica*" not prove to be a good stock for some of the desirable kinds cultivated, the seedlings, or cuttings of the eastern frost and riverside grapes (*Vitis Cordifolia* and *Riparia*) would be next in order, and not difficult to obtain.

II. CELLAR AND LABORATORY.

The funds provided for in the legislative Act not having become available until the last week of August, the building and cellar needed for the purpose of the investigation of grapes and wines was not ready for occupation until October 10th; so that the early part of the vintage season was past before operations could be begun. Fortunately, the season this year was so late that grape varieties whose season would ordinarily have been past at that date, were still available. It has thus been possible to take in hand some of the more important wine grapes, and the experience gained in the details of the work will render it much more rapid and profitable, in the way of results, during the coming season.

The cellar has been dug into the hillside falling off toward Strawberry Creek, near the "South Hall" of the University. The walls are of brick, 20x46 feet, and the clear height eight feet; on the upper side they are sufficiently above ground to give room for transom windows, while on the side toward the creek, all but the foundation is above ground, and a large double door forms the main entrance. This gives access to a passage seven feet wide, which divides the cellar into two nearly equal parts, by brick partitions. This division is for the purpose of being able to use a different temperature in each, as may be necessary. The transom windows have double sash, to guard against outside changes of temperature, and two ventilators are placed in each compartment. Both have floors laid in cement, so sloped as to drain any water that may be used on the inside, or enter from the outside; but the latter contingency is provided against by a filling-in of rubble, between the walls and the hill, and drains laid in the foundation. The whole is covered by a wooden building, which was moved upon it from its former site, higher up. It is partly occupied as a carpenter shop; a room, 20x11 feet, at its eastern end, has been fitted up as a viticultural laboratory, which communicates with the corresponding compartment of the cellar by a trap-door and stairs. It is properly fitted up with work tables, shelves, closets, sink, a stove with steam bath, and also serviceable for heating a moderately large iron kettle; a small wine press, grape crusher and stemmer, a number of half-barrel tubs; saccharometer, alcoholometers, a number of thermometers; a small still for determining the strength of wines, etc.; and such other appliances as are needed in an analytical laboratory, as, also, gas and water. The cellar compartment underneath is, moreover, provided with a small stove, for the maintenance of the proper temperature. The whole building is so well protected and shaded by trees, that the latter point is rendered comparatively easy to guard.

III. PLAN OF WORK.

The kind of work intended to be done for the benefit of the viticultural industry, is sufficiently defined in section eight of the Act making the appropriation. It has been my endeavor to comply with both its letter and spirit, by undertaking, first, such portions of the proposed investigations as seemed most important, and adapted to the season. The field work done with a view to the Phylloxera problem has already been alluded to. In the laboratory work, the preparation of wine samples, and the analysis of grapes and must, were obviously the first called for.

The plan adopted in this matter is in conformity with my view, expressed in my previous report, and shared by the best vintners in the State, viz.: that among the first necessities of the present situation of California wines in the world's market, is the establishment of more definite qualities and brands, resulting from a definite knowledge of the qualities of each of the prominent grape varieties, and of their influence upon the kind and quality of the wine, in blending before, or as the case may be, after fermentation; of the treatment required by each in the cellar, during the time of ripening; and finally, of the differences caused by difference of location, climate, etc., as well as by different treatment of the vines themselves.

Heretofore, in the great majority of cases, the whole subject of qualities and brands has been in the hands of the wine dealers, who received from the producer indefinite qualities and quantities of wines made from unknown mixtures of grapes, and had to be governed almost alone by their taste in the important matter of making blends adapted to the taste of wine consumers. That under these circumstances the result should not have been altogether a happy one, or most favorable to the market value of California wines, is not surprising. When the fermentation is once over, the most important period in the life of wines is past; and the corrections that can be made afterward, by the mere blending of ready-made wines, is like the education of a human being after the golden time of youth has passed unimproved. Something can be accomplished even then, but the best possible results are rarely attained; and in order to cover the defects as much as possible, artificial aids and high-pressure methods are employed. Thus far the reputation of purity—of containing nothing that is not of the grape—has been the preëminent virtue of California wines, which has covered a multitude of sins committed in their preparation. It is to be hoped that wine growers will see to it that this reputation shall continue to be deserved, and that hereafter, their product shall be of such quality as not to be ashamed of its birthplace, or to stand in need of borrowing either foreign labels, names, or flavors.

With this end in view, I have selected for the work that time permitted us to do this season, some of the prominent grape varieties still available; the plan adopted being as follows: to make of each kind of grape, not less than seven gallons each of white, and of red wine; that is, of wine fermented on the skins for a suitable length of time, as well as such resulting from must freshly pressed. In the case of white grapes, this, of course, alters but little the ultimate tint of the wine, but imparts to it a larger amount of acid, of tannin, and of "body," or extractive matters; while in that of black, or colored grapes generally, the color extracted from the skins is added to the above ingredients, forming properly "red" wines. The difference, however, extends far beyond the mere extraction of the substances preëxisting in the grape; since especially the presence of the acids of the skins influences very powerfully the formation of the specific aromas, or "bouquet" of high flavored wines.

The above mentioned seven gallons of each kind of must, or wine, are divided between a five and a two-gallon demijohn, for the first or violent fermentation; while for the second or after-fermentation, after racking off from the lees, the five-gallon vessel, filled full, serves as the permanent receptacle. A constant daily record is kept of the temperature, condition, etc., of the wine as its fermentation progresses; the temperature of the cellar being kept, as steadily as possible, between 60° and 65° Fahr., up to the time of racking off.

As a matter of course, the analysis of the must has to be carried out as soon as practicable after the pressing; and this necessity greatly restricts the number of such experiments that can be made in any one season, so long as only a single person is employed at a time. I hope in future years to be able to throw at least one additional (temporary) assistant into this work during the vintage season. In the absence of such aid, during the vintage just past, the determinations made have been much less complete and detailed than it is desirable that they should be in order to ascertain all the points that influence the quality of the resulting wines; and the grapes worked embrace but a few of the many varieties that should be investigated.

Immediately after the pressing of the "red" wines, a test is made to determine the amount of acid present, for comparison with that contained in the "white" must. A redetermination of this, as well as of the other ingredients, or in other words, a complete analysis of the ready-made wines, will of course be made at the proper time. It is also intended to analyze for comparison, such wines furnished from perfectly reliable wineries, where an exact record of the origin and manufacture can be obtained. In the absence of such data, the analyses could be of no general interest or use.

The weight of the pommace obtained from a given amount of grapes is also recorded, and a sample of each kind rapidly dried and preserved for future examination. Detailed determinations of the wine-forming ingredients remaining in the pommace have not been made this year, for want of time. For the same reason, the analysis of vineyard soils has not yet been begun, but the subject will be taken in hand so soon as other work that from the nature of the case cannot be deferred, shall permit. A number of soil analyses heretofore made, however, bear directly on this question, but cannot be usefully discussed at this time. There is reason to hope that the interest now aroused among vine growers, both by the fair prospects of the industry in its commercial aspects, and by the danger that threatens it from the invasion of the Phylloxera, will hereafter bring about such coöperation with the University experiment station, as will be of great service in placing the viticultural industries upon a safe and rational basis. To this end, however, local experiment stations in the several grape-growing regions of the State, are sorely needed, since it is impossible without these to secure such consistency and accuracy in carrying out the experiments indicated by the investigations made, as will elicit decisive results. The suggestion of a plan to accomplish this at a very moderate outlay (in response to the provisions of section eight of the Act making the appropriation under which this work has been done), accompanies this report.

Considerable annoyance and inconvenience has been experienced in the matter of transportation of the delicate-skinned wine grapes, and this is one reason why they have not as yet been brought on from more distant points. The Burgundy grapes from San José, and the Burgers from St. Helena, have remained three days on the road, although shipped by express, and when received were in bad condition. Special arrangements will have to be made hereafter, to avoid this serious evil.

Results.

A tabular statement of the results thus far obtained in this season's work, is subjoined. It is of course too soon to attempt much in the way of generalizations from such meager materials, the more, as the season was a somewhat anomalous one in respect to the low temperature of spring and summer. Probably none of the grape varieties worked had acquired their full, or at least their maximum sweetness, and hence the sugar percentage of the must doubtless has been, and the alcohol percentage of the corresponding wines will be, somewhat below the normal amount. It may be hoped, however, that this circumstance will be in favor of a higher flavor of this year's vintage, since an excess of alcoholic strength, and a corresponding lack of "bouquet," is the besetting fault of California wines in general. This may seem strange doctrine to European vintners, who are in the habit of looking with anxiety for every hour of sunshine. But the fact is that a "cool" summer in the California wine districts is still a good deal warmer and more sunny than the sunniest summers of middle and northern France and of Germany, and normally tend to produce, not the high-flavored wines of those portions of Europe, but the hot and comparatively insipid product of the Mediterranean shores. To moderate this tendency as much as possible, by a proper selection of grape varieties, and by the methods of treatment of the vine, the grape, and the wine itself, appears to me to be the policy best calculated to bring the pure wines of California into use as table wines, instead of the numerous artificial compounds now so commonly dispensed as "table claret" under French labels. Whatever opinion may be held in regard to the question of temperance and total abstinence, there can hardly be a difference of opinion in regard to the choice of presenting to the consumer, on the one hand, a beverage that "cheers, but not inebriates," unless taken in immoderate quantities; or on the other, such as not only intoxicate even in small quantities, but are moreover drugged with an endless variety of pungent compounds unfit for human consumption. The history of the introduction of the fatal "absinthe" into France, whose peasantry has from time immemorial considered the mild wines of the country as a part of their daily food, is pregnant with instruction on this point; as is, in Germany, the record of the introduction of cheap "potato whisky" in the place of wine and beer. The abject poverty that in Europe so frequently causes the resort to strong liquor, is fortunately not one of the general predisposing causes in this country. But cheap whisky and dear wine have undoubtedly had their share in promoting the vice of drunkenness in the United States, where the keg of whisky, or alcohol, has accompanied the pioneer to the remotest corners of the country.

ANALYSES OF GRAPES AND MUST.

The record of results thus far obtained in this work is given here for the information of persons interested, without comment or discussion, at this time, and until the analysis of the corresponding wines can also be given.

No. 1.—The first grapes used for making wine were Mission grapes, sent by Dr. J. Strentzel, of Martinez, about October 10th. They were picked when only just ripe, in order to compare them with grapes from the same place when fully ripe, and containing the maximum amount of sugar.

They arrived in good condition, and were immediately stemmed and crushed; and one half made into red, the other half into white wine. Fermentation began on the 14th of October, and, on the 23d, the red wine was pressed from the pommace. Both wines were racked off from their lees November 26th.

No. 2.—Zinfandel grapes, from Mr. C. Krug, St. Helena; sent October 22d. They were very ripe and soft. They were treated in a similar manner to No. 1. Fermentation began on the 23d of October, and the red wine was pressed on the 31st. November 29th the wines were racked from their lees.

No. 3.—Malvoisie grapes, from Mr. C. Krug, St. Helena, sent October 28th. They were just ripe, and in good condition. They began fermenting on the 29th, and the red wine was pressed on the 8th of November; on the 9th of December they were racked.

No. 4.—Pineau of Burgundy, sent by General H. M. Naglee, San José, October 30th. They were packed in large barrels, and had been delayed on the road, so that, when received, they were in bad condition. The juice had run from the loose grapes, so that it was impossible to determine the proportion of juice and pommace in the grape. The best ones were taken for making white wine. Fermentation began on the 1st of November; on the 11th the red wine was pressed, and, on the 28th, both wines were racked from their lees.

No. 5.—Burger grapes, from Mr. C. Krug, St. Helena, sent November 4th. The grapes were in a very bad condition; many had already soured, and could not be used. Fermentation began on the 4th of November. The "red" wine was pressed November 13th, and both wines were racked off November 28th.

No. 6.—Mission grapes, fully ripe, sent by Dr. J. Strentzel, Martinez, November 10th. They were in very good condition. Fermentation began on the 12th of November; on the 22d the red wine was pressed, and racked December 15th.

The must from some other specimens of grapes has been analyzed, but no wine was made from them.

Name.	Color of Wine	Total Weight in Pounds	Pommace, per cent.	Stems, per cent.	Gallons of Must	Temperature of Must	Specific gravity of Must	Solid Contents, by Spindle	Residue by Evaporation, per cent	Grape Sugar, by Polarization	Fruit Sugar, by Polarization	Total Sugar by copper test	Acid calculated as Tartaric Acid	Amount of Standard Alkali Solution to neutralize ten c. cm. of juice
Mission (just ripe)	White.	/				24°	1.0665	16.2	16.32	6.55	10.22	16.77	.414	.552
Mission (just ripe)	Red.	71.75	13.5	3.05	6.95								.281	.375
Mission (fully ripe)	White.	106.5	18.3	3.75	9.2	13.5°	1.085	20.4	20.05	9.46	13.64	23.1	.458	.610
Mission (fully ripe)	Red.	101.	11.63	3.96	9.4								.360	.480
Mission	White.					16.5°	1.100	23.75	23.68	7.54	16.15		.375	.500
Zinfandel	White.	84.	27.3	5.75	6.2	18°	1.088	21.06	Lost.	7.08	12.48	19.56	.405	.540
Zinfandel	Red.	126.	13.4	5.55	11.2								.394	.525
Zinfandel (second crop)	White.					22°	1.060	14.66	15.16	7.81	11.32	19.13	.756	1.008
Malvoisie	White.	116.	18.1	2.58	9.9	19°	1.110	25.87	22.24	12.05	16.71	28.76	.338	.450
Malvoisie	Red.	151.	10.92	2.65	14.1								.295	.393
Burgundy	White.	97.	30.92	6.18	7.0	20°	1.050	12.25	11.44	4.81	7.59	12.4	.657	.876
Burgundy	Red.												.563	.750
Burger	White.	74.	22	.97	6.4	19°	1.065	15.83	13.28	6.51	9.06	15.56	.677	.903
Burger	With skins	95.	12.1	7.36	8.6								.75	1.000

APPENDIX No. 9.

REPORT ON THE OCCURRENCE OF THE PHYLLOXERA IN CALIFORNIA.

MADE UNDER THE DIRECTION OF A JOINT COMMITTEE OF THE STATE VITICULTURAL COMMISSION AND THE UNIVERSITY OF CALIFORNIA, BY F. W. MORSE, ASSISTANT IN CHARGE OF THE VITICULTURAL LABORATORY OF THE UNIVERSITY.

Professor E. W. Hilgard, University of California, and C. A. Wetmore, Vice-President State Viticultural Commission:

In accordance with your instructions, I have visited and examined, as detailedly as was compatible with the limited time and the large extent of territory to be covered, the principal grape-growing districts of the State. It being impossible, within the time allotted, to visit all the vineyards of each district, some of the more prominent ones were taken as representative of a district, and made starting points for the work; ascertaining, by inquiry, whether any others seemed to present indications of disease. Such, also, were subsequently visited, and a careful examination made to determine, if possible, the nature and cause of the disease; the phylloxera, of course, being considered the chief subject of investigation. Where actual observation was impossible, I have given the information just as received from the observer. Much of the information thus obtained may not be very exact, as but few vine growers keep a record of diseases and pests in their vineyards; but it will give a general idea of the nature of the trouble, and injury done by the more common pests.

Many of the vineyards actually infested were reported as being in a healthy condition; but, upon examination, were found to contain spots that must have been infested for several years. The spots had received no attention, as they were considered merely the result of "poor soil," "wet spots," or "bad cultivation." Other infested vineyards had changed hands so many times that it was impossible to get any information regarding their past history; and the information on pests other than phylloxera, was considered rather as incidental to this work, and consequently did not receive the attention that its importance might otherwise have demanded. The season was already so far advanced that many of the injurious insects had disappeared, and thus only the effect of their work could be observed. The field work was begun August 9th.

SONOMA COUNTY.

A few vineyards near Sonoma were first visited, in order to become more familiar with the appearance of an infested vineyard before beginning actual field work. No notes of importance were taken at this time.

On Mr. Attila Haraszthy's place, a short distance east of Sonoma, there are a few remaining vines of an old vineyard growing about his house, apparently in good condition. The Mission vines, destroyed by phylloxera, were taken up in 1877. The vines now growing have received no attention since the vineyard was abandoned, but have continued to bear, and now form an arbor about the house. The soil is very hard, gravelly, and poor. The roots, as shown in a cellar near at hand, grow ten or twelve feet deep.

The vinehopper is plentiful on the arbor vines, but do not infest the vineyards to any great extent. They made their first appearance in 1863; in 1864-5 they prevented the grapes from ripening, and seemed to threaten the whole vineyard with destruction. Their most violent attacks were along the banks of creeks. They began to disappear in 1870. In this vineyard I saw another case of an apparent check in the movement of the phylloxera. A block of White Frontignans, separated from a block of Mission vines by a road thirty feet wide, is but just beginning to be affected. A portion of the Mission stocks have been taken up, the remainder is almost beyond recuperation. The road is used as a turning ground for teams during cultivation.

Similar cases of protection are seen in other localities, where a wide road is used simply as a turning ground, and is not cultivated across.

Examination of the Butler Vineyard.

The abandonment of culture of vineyards has been advanced as a remedy against the phylloxera. In order to investigate this theory, an old abandoned vineyard, known as the Butler Vineyard, was visited. This lies on a gradually sloping plane, midway between the foothills and the creek, on the east side of the valley, one mile northwest of Sonoma. Two sloughs drain the eastern part; one just touches the edge of the vineyard, the other forms a small ravine running diagonally across the lower part. The southern part is a low basin, comparatively dry in summer, but wet in winter. The western part is higher and more rocky; toward the north the soil is more reddish, and harder to cultivate. The southwest corner is higher, and cultivated, although badly infested with phylloxera. All through the vineyard, the soil on the higher ground is generally red and gravelly, in the lower basin it is black and gravelly, while in the bottom of the sloughs blue heavy adobe predominate. Bedrock and large bowlders are found at or near the surface. It was abandoned in 1876; since that time portions of it have borne marketable grapes. This year a larger proportion of vines than usual seem to be dying.

The first vines examined were in the northern part, adjoining Mr. Haraszthy's new vineyard. It has not been pruned since it was abandoned. The soil here is light adobe, well watered, and very hard; depth, two feet to bedrock; drainage, poor. The first vine taken up had a very good growth of foliage, canes short; roots were vigorous with large quantity of sap; taproot well supplied with rootlets from a few months to two or three years' growth. Along the sloughs, or near low wet land, the vines look stronger, with heavier growth, color is darker, and there is less appearance of decay. The vines on the small ridges seem to have had a good growth the first year after being abandoned, but have gradually failed, until, this year, many have died. The second vine was taken up near the first, with soil and other conditions similar. It had no fibers, poor foliage, and roots very sappy. Black-knot was just beginning to make its appearance.

The third vine was taken up a short distance west of the first and second, where the soil is lighter and more gravelly. Foliage, heavy; roots were large, but all the old fibers had been eaten off, and new ones, strong and healthy, were just beginning to grow.

No phylloxera was found on these three vines.

Vines were also taken up in the southern part of the vineyard. This was left in 1875, and has not been cultivated since, but was pruned in 1877. The soil is apparently strong; light reddish color; bedrock comes near the surface. One of the vines was taken from an old phylloxera spot, in the center of which the stocks were dead; around the margin there was good growth, but the leaves were turning yellow. Near this spot three vines of medium growth were examined. Phylloxera was found on the last one, about 18 or 20 inches below the surface of the ground, where the taproot made an abrupt bend at right angles. They were concealed under the bark of last year's growth. They were few in number, very small, yellow, and inactive. The root was drier, much firmer, and of a lighter color than those previously taken up.

On August 11th, ten more vines were examined in the Butler Vineyard. The first had a heavy foliage; vines around it were large, and had a good color. Soil, grayish adobe, 18 inches to bedrock. The second was a poor vine, with rotten roots, grown on lighter soil, and but a few feet from the first. The third and fourth were taken at some distance from the first two. Both had good growth and healthy fibers. The remaining vines were taken from the lower part of the vineyard, near the spot where the infested vine was found last night. The fifth vine looked very much like the infested vine, and would have been included in the circle of this newly attacked spot. The sixth, near the fifth, was nearly dead; small amount of foliage. Seventh, eighth, ninth, and tenth were taken from different points in the vineyard, south and west of the infested spot; tenth vine, large; medium foliage, quite yellow; roots, sickly; no fibers of this year's growth. It was taken from a slope of a ridge a short distance from the slough. A few small inactive phylloxera were found on rootlets two or three years old.

In order to make this investigation more complete, on August thirteenth other vines were taken up in the central and western part of the vineyard. It seems that the phylloxera is making a second attack, as shown by the growth of cane since the vineyard was abandoned. One of these spots includes thirty-five dead vines. In the center is a single vine without cane; two rows each way are vines having two years' growth of cane; the remaining vines have good canes with small dry leaves upon them; surrounding these are vines in the yellow leaf. Upon one of these was found small, sluggish phylloxera just at the surface of the ground. Soil was red, very dry, and in good tilth near the vine. Vines near this spot were looking well. They had a dark green color, good growth, and only a few were dying. Next examined a vine a few rods from the road, on the west side of the vineyard. It was four feet from a row of apple trees, bordering a wide avenue. The vines near the avenue were in good condition, and apparently healthy. Phylloxera was found eight inches below the surface of the ground, under the bark of a decaying root. Many of the fibers of a few months growth were not affected. Examined another vine near the road, and a few feet from the stone fence. This had a good growth of foliage, leaves exceptionally healthy, growth of cane not very long, due to poor hard soil rather than to disease. Small fibers not affected; taproot juicy and solid. Four or five phylloxera were found under the outer rotten bark. From the third row of vines toward the center of the vineyard the stocks are all dead.

From the observations recorded above, it appears that the vines now infested are confined to light and red soils. The adobe soil produced larger and healthier vines; these were not infested at the time, possibly never, although they were surrounded by infested spots. Where the red land close around the vines was in good tilth, the greatest damage was being done. It was on this kind of soil that the renewed attack of the insect was most visible. The abandonment of this vineyard can scarcely be considered a success as a remedy against phylloxera. The insect is still there in sufficient numbers to completely destroy the vineyard so soon as cultivation is resumed. Even though the vineyard was free from them, it is in such a condition that it would be easier to replant than to rehabilitate the old vines.

In Sonoma Valley the phylloxera extends from the lower part of the valley, on the south, to near Guillocos Valley, on the north. A detailed investigation of this district was not made.

Santa Rosa District.

In order to find the limit of phylloxera invasion from Sonoma Valley toward the west, a careful search was made through Bennett Valley, thence to Guillocos Valley. Among the vineyards visited were those of Messrs. De Turk, Carr, Stocking, and McCuen. The first spot infested with phylloxera was found in Mr. J. Williams' vineyard, between Sonoma and Guillocos Valleys. Bennett Valley was infested with vinehopper three years ago, but only a few remain. Cutworm did some damage this spring. Grasshoppers are numerous and increasing in Glen Ellen District. Black-knot is not uncommon. Many Mission vines in Mrs. Hood's vineyard, in Guillocos Valley, are dying. Blight is very common through this whole district. Vineyards near Cloverdale have several insect pests, but not in numbers sufficient to do much damage. Mr. Stegerman's vineyard has suffered considerably from the attacks of vinehopper and grasshopper, the latter infesting only young vines. The vinehopper is a small green fly, closely related to the hopper that was so destructive to vines in the New England States. Mr. Haehel's vineyard, adjoining Mr. Stegerman's, contains several spots very characteristic of phylloxera spots. They have been noticed for four years. Spots replaced by cuttings three years ago are doing well. Soil is clay with compact clay subsoil. The spots are, without doubt, caused by planting vines over decaying stumps. There are several similar cases in the district where this can be shown to be the true cause. There is scarcely any blight; grasshoppers are plentiful; cutworms very few. Mr. Caldwell's vineyard, south of Cloverdale, was infested with cutworm three years ago. This year the vinehopper is doing some damage. Black-knot is affecting his muscat vines.

Messrs. J. R. Mowbry and S. Larrison have vineyards two miles north of Cloverdale, the former very badly damaged with vinehopper, and both have spots caused by the rotting of stumps; oak stumps seem to be especially hurtful. The latter gentleman has found long wood worms in the rotten roots.

NAPA VALLEY.

The next region visited was Napa Valley, and its branches. In order to locate definitely each vineyard, I shall consider this region in four subdivisions—the Western, embracing all the vineyards on the western side of the valley, up to Yountville; the Northern, embracing the valley north of Yountville; the Eastern, including vineyards south of Yountville, on the east side of the valley; and, finally, Brown's Valley.

Western District.

The vines in this district were looking well. Thomas Reid's, or McDonald's farm, was the first visited on August fourteenth. It is situated about two miles west of Napa, on the hillside facing the valley. It contains twenty acres of vines, mostly Mission, Black Malvoisie, and Zinfandel; part of them are fifteen years old, and grown from cuttings. Small spots of infested vines are found on the hill, in a vineyard separated from the main one, and one spot on the edge of the vineyard, near a vacant field which adjoins it on the west; 300 or 400 vines are attacked, mostly of the Mission variety. The disease has been noticed for three years. The soil is somewhat clayey (adobe), but not hard to cultivate; upon the hillside it is sandier and not very deep. Mr. McKay's or Jones' vineyard adjoins Mr. Reid's. It has an eastern slope, contains thirty acres of vines, and several spots of phylloxera.

Mr. McClure gave me the following information regarding his vineyard of twenty-five acres, three miles south of Napa:

Tokay and Mission vines, on the eastern slope, are the most affected. One hundred vines have been taken up and as many more should be. It has been noticed two years. The soil is only eighteen inches deep, and originally grew large ferns. He has another vineyard of fifty acres, seven miles south of Napa, of which three acres have been destroyed by phylloxera, and many new spots are now appearing. The invasion began in one spot of Rose of Peru, and continued two years, then left it entirely; from there crossed a road twenty feet wide, to a patch of Muscats, where the insects are still working. They skipped to Malvoisie vines, a distance of 300 yards, and apparently recrossed an untraveled road three times. They began the attack five years ago, and are making more progress this year than any preceding. The soil is heavy, rich, strong adobe, ten feet deep, and not very moist. The phylloxera is supposed to have come from infested boxes sent from Sonoma, where a crop of grapes was sold and the boxes returned. Rose of Peru vines are slightly affected with blackknot.

Just at the entrance of Brown's Valley is a vineyard of ten acres of Mission vines, few foreign, rented by Mr. Headley. In the center is about an acre infested with phylloxera; also, small spot in the south end. In the center of a large infested spot are but few dead vines; the extent of yellow-leaf vines surrounding it, however, is very large.

The destruction has been greatest in a low swale on the hillside, where the soil is moist, rich, and easily tilled. The area infested here is not so plainly marked as below, where the soil is drier.

Just at the north entrance to Brown's Valley, but still within that of Napa, are two vineyards, probably the worst infested in the whole valley. Two years ago, one of these, Mr. Buhmen's, consisting of eighty acres, was attacked, and now fifteen acres are nearly destroyed. The insect is traveling very fast toward the east this Summer, without making any apparent distinction as to variety of vines.

Mr. Fisher's vineyard of ten acres, adjoining the school property, northeast of Mr. Buhmen's, has a large spot near the center, which must have been infested for between two and three years. Other spots are slightly attacked. The soil is rich but somewhat gravelly. Mr. Haake has two acres of vines, of which half an acre is badly infested. It has been four years since first noticed, and was supposed, at the time, to be caused by low, wet, land. Only old Mission vines are affected. He has ten acres of young vineyard, situated on the hill half a mile west of the infested one, that is perfectly healthy.

Adjoining Mr. Haake's is the Oak Knoll estate, of 2,000 acres. The young vineyard belonging to this estate is situated on a hard, gravelly ridge, sloping to lower adobe land near the creek. It seems to be free from the pest. The old Mission vineyard, of two acres, planted on adobe soil, has an excellent growth of foliage, but is not free from phylloxera. At the eastern extremity of the narrow patch, where two large avenues, lined with large trees, intersect, is a spot of twelve sick vines, with comparatively short growth. Phylloxera was found in abundance, just at the surface of the ground, under the old bark. They have been sick about two years. The soil is heavy adobe, very hard, and lumpy; cultivation, medium. In another part of the vineyard I found some specimens of galls upon the leaves. I was unable to determine what caused them, but they are certainly not phylloxera galls. The vines are looking well in Mr. Evans' vineyard, adjoining Oak Knoll. Mr. Parmers has a patch of Mission vines, near a creek, that are very badly infested with a gall upon the leaves, some of the leaves being nearly destroyed. The microscope shows it to be a large fungus growth. Mrs. Blanchard has two quite large vineyards, both infested. One, lying south of the house, is about eight years old. It has a large infested spot, on the northeast corner, where considerable damage has already been done. The soil is alluvium, washed from the hills, underlaid with heavy adobe. The vineyard on the north side of the house is very badly infested. The attack began in a low swale upon the hillside, and spread in every direction, more rapidly toward the south, where the soil is drier and the hillside better drained. The spot includes soil varying from heavy adobe, through alluvium, to reddish hillside. Mission vines were first attacked, but the spread now includes all varieties, without apparent choice.

Mr. Valzs' vineyard, one and a half miles from Yountville, has no apparent phylloxera spots. Mr. G. Groezinger's vineyard, at Yountville, is the limit of the phylloxera ravages up Napa Valley, with the exception of Mr. Weinberger's, at St. Helena. One phylloxera spot has been noticed for six weeks, but it has probably been attacked for two or three years past. Sixty Zinfandel vines have been destroyed. The spot is on low ground, quite wet in Winter, with poor drainage. The soil is three feet deep, hard just below the surface, and quite sandy. Mr. Groezinger supposed the spot to be caused by frost. "The vines crack open, and a small insect eats the heart of the vine, and passes down to the roots."

Brown's Valley.

Brown's Valley is a branch of Napa Valley, west of the city of Napa. It is separated from the main valley by a low range of hills, which support quite extensive vineyards. A small branch valley at its head connects it with Napa Valley, about two or three miles above the main outlet. The vineyards in this district, that are not badly attacked with phylloxera, are bearing good crops, but the attack of this insect is so general that the outlook for this valley is not very encouraging, unless an effective remedy is soon found.

Just inside of Brown's Valley is a vineyard of fifteen acres, owned by Mr. Kneiff. Twelve acres are now bearing.

A single spot of a few vines, on the point of a hill where the soil is poor, shallow, and rocky, is all that seemed to be attacked by phylloxera. Of ten acres of ten-year-old vines, adjoining this vineyard on the north, one acre, mostly Mission, is infested. The wettest part of the hillside is the worst attacked.

About four years ago a small "black bug," or "worm," attacked and punctured the leaves of the vines, leaving small black spots. From the leaves they went to the canes, attacking them in a similar manner. The leaves soon began dropping. Mr. K. applied a mixture of slaked lime and ashes, in the fall, just before the rains set in. The remedy was effective. The vines were infested about three years in all. He has, also, noticed "black mildew" upon some of his Mission vines. The affected leaves become covered with first brown, then black spots; they then dry and drop off. The grapes are similarly affected at the same time.

It has appeared five successive years, but no considerable or permanent injury resulted from it.

Mr. M. Jamsen's vineyard of 16 acres lies three miles from Napa, in Brown's Valley. It contains many varities of table grapes, ranging from ten to twenty years old. Cuttings came from Mr. McClure's, below Napa. Three acres have been completely destroyed. Two and one-half years ago he noticed a "yellow scab" on a very black taproot of one of his vines. Tokay, Black Morocco, and Mission, seem to resist the phylloxera better than the other varieties. Of the three varieties, Tokay, Muscat, and Malaga, the last was the first to be affected, although they grew side by side. This year the phylloxera is spreading very rapidly in the Malaga and Muscat of Alexandria; last year only a few vines were attacked. Eight hundred vines in a single block of Muscats are affected. Mr. Jamsen has

Muscats growing on low, rich, wet soil, which are badly infested, while the same variety growing under similar circumstances, and with equal chances for becoming affected, are free from the pest. The infested vines are mostly grafted on Mission stock. The soil composing the larger part of his vineyard is black adobe, and a clay hillside soil, with clay subsoil, generally moist, with system of underdrains beneath the low spots.

Two vineyards belonging to Mr. Mansfield and the Napa Bank are badly infested.

Mr. Fay, adjoining Mr. Jamsen, has twenty-four acres of vines; five infested. Two acres have been taken up. Mr. Marshal has twenty acres, and but few infested vines.

Northern District.

This district was visited August 17th. The vineyards are doing very well, and producing an immense crop. Vineyards lying between St. Helena and Yountville were not examined in detail. No trace of phylloxera has thus far been found or reported in this district, with the exception of a spot in Mr. Weinberger's vineyard. According to information later obtained, I find that Mr. Weinberger, near St. Helena, noticed a spot of sick vines in his vineyard one year ago, and it is now enlarged so that it includes one hundred infected vines. These vines are nine years old, and include the Muscat variety, grown from cuttings taken from Mr. Krug's vineyard. Soil is gravelly, shallow, and not rich.

The Muscats extend around a hill, and are surrounded on either side by Chasselas that remain untouched.

Black-knot is quite frequent, and some other pests have troubled the vineyards, but have done little injury.

Eastern District.

The vineyards on the east side of Napa Valley were visited August nineteenth. The vines were in a good condition. The first was Mr. H. Hagen's, three and one half miles northeast of Napa, on rolling land, near the mountains. He has eighty-three acres bearing, and twenty just planted. The phylloxera began on a spot of light alluvial soil, and spread toward the north, over a light, shallow, dry soil. Further toward the north is a spot on reddish soil.

From the original spot, the spread was rapid toward lower land, that is deeper and more moist. It was first noticed on Mission and Malvoisie vines, about four years ago. Two acres, at least, are quite badly infested now; and without doubt a much larger area will be noticeable next year.

Mr. Hagen has grafted on old Mission roots, over infested spots, both Malvoisie and Zinfandel varieties with apparent success. The growth is large this year.

Dr. Leach's vineyard of thirty-three acres has one spot of phylloxera on the upper side, near a field that has just been replanted with vines. This newly planted patch was originally occupied by Mission vines, but, on account of unproductiveness, they have since been taken up. The spot infested contains twenty vines, having short growth, with no sickly or decaying ones adjoining. It has been "sick" four years and spread very little. Possibly it became infested from the vines that have been taken up. Phylloxera was found on the tap root, very near the surface of the ground. The soil is gravelly, very wet and hard where infested, but can be easily tilled. Mr. Emerey's vineyard, near Dr. Leach's, is quite badly infested. The spots are more numerous on the hard soil. Other vineyards in this neighborhood are also attacked.

Mr. M. M. Estee's vineyard, just in front of his house, is apparently free from phylloxera. His vineyard opposite General Miller's contains a spot of one hundred and fifty vines that are infested, and, without doubt, a much larger area toward the south will be destroyed by another year. The vines are small; soil varies from clay to loam, and is not very deep. The infested part is on a ridge easily drained, and comparatively dry. There is, also, another spot north of the first, and on the northern slope of the hill. Soil and other conditions similar to the first.

General Miller's vineyard contains no phylloxera. His old Mission vines are suffering badly from black-knot; some on low wet spots, and heavy adobe soil, are dying from its effects.

Mr. S. Fawley has forty acres of vines on the Napa Soda Springs road, near the foothills. The Mission vines, sixteen years old, are poorly cultivated, and in a poor condition. It has one spot of phylloxera that has been noticed for three years. The spread is very slow; vines adjoining the dead ones are apparently as healthy as those in other parts of the vineyard. The soil is red, somewhat gravelly, very wet in the winter, and hard and dry in the summer.

I found no phylloxera in the next two vineyards visited, but again found them in Mr. Frank Salaminas' vineyard, six miles below Yountville. The attack began on old Mission vines, just on the edge of the tract, three feet from a deep ditch. About fifty vines have already been taken up, those very near the spot are just beginning to look sickly; spread is very slow. The insect must have been at work three or four years. The soil is alluvial, washed from the canyon, eighteen inches deep, underlaid by a coarse, gravelly, subsoil. The vines are well cultivated.

Messrs. A. D. Grigsby's, L. G. Grigsby's, and W. L. Johnson's vineyards—the latter within one and one half miles of Yountville—were visited, but no infested vines were found.

At Mr. L. G. Grigsby's many vines are suffering from blight; the leaves dry up in a day or two, and at the same time the grapes turn black.

VACAVILLE AND PLEASANT VALLEY, SOLANO COUNTY.

This region of Solano County was visited September 7th. The vineyards here have suffered greatly from disease and pests, but this year they are looking better. Mr. Allison's, one and a half miles east of Vacaville, contains six or eight acres of vines, some of them twenty years old. It originally contained forty acres. Five or six years ago he began taking up infested vines, and has continued until it is reduced to its present size. The soil is alluvium, with adobe subsoil. Adobe forms the surface in *the larger* part of the vineyard, and is very badly cracked. Phylloxera was found on rootlets one fourth of an inch in diameter, one or two inches below the surface of the ground. Missions, and Sweetwater grafted on Mission stocks, are attacked. Cuttings were from Mr. M. Wolfskill's vineyard. Mr. Allison says the vines are killed by a large knot growing upon the roots. Other vineyards south of here have been taken up.

The Verdi vineyard, three miles northwest of Vacaville, is very much neglected. On the lower bench of the vineyard are spots which look suspicious, but upon investigation no phylloxera could be found. The roots were apparently decaying from the effects of an old stump, over which these vines were planted. Other vineyards up the valley are not looking well, but signs of phylloxera are not noticeable among them. Mr. J. Buck, near Pleasant Valley, has fifteen acres of old vines, and twenty-two acres of one year old. This year he noticed a sickly spot among his old Sweetwater vines which proved to be due to phylloxera. It must be two or three years old. The soil is very deep, moist, well tilled alluvium, with gravel underlying. This vineyard has produced enormous crops.

Mr. Thurber has a small vineyard near the center of Pleasant Valley. He once had forty acres, but it is now reduced to six. His foreign varieties came from Mr. Thompson's, at Soscol; Rose of Peru came from Mr. Buck's. He first noticed the vines failing in 1866. In 1870 the Mission vines were cut down and grafted to Tokay; these did very well for a few years, but are now failing. A large spot of Rose of Peru has been unhealthy for three years, but still continues to bear fruit, although the vines have short growth and yellow leaf. Infested Rose of Peru vines have been taken up, and, two years after, the sprouts growing from the old roots were perfectly healthy and vigorous. We dug up an old Rose of Peru layer, three feet deep, which had been covered up two years ago, when the remainder of the vineyard was taken up. Phylloxera was found upon the under side, where the juice was running out of the stem. The roots were partly dead. A Mission layer that had been in the ground three years, was also taken up. It had thrown out a large growth of cane, but bore no fruit; Phylloxera infested the young and tender rootlets. Barbaro vines seem to resist phylloxera attacks; also Early Black Cluster. In his old vineyard are three rows of different varieties of vines, adjoining each other—Early Black Cluster, Mission, and Sweetwater. In the middle was the Mission, almost dead; five feet from it the Early Black Cluster grew healthily, and produced a good crop. The roots of each variety were infested, but the Early Black Cluster only slightly. Thinning out the vineyard produces a good effect upon the remaining vines. Three successive wet seasons checked the attack for a time. A great many of the old vineyards, that were planted in the valley, have been dug up and replaced with fine orchards. There are a few vineyards on the hills that are not badly, if at all, affected. Mr. Cantelow's, on the hill, has no visible signs of phylloxera, but is very badly attacked with vinehopper. The soil through the middle of the valley is part adobe, the remainder being a very deep alluvium; nearer the hills it is more clayey. It is said that the stiffer and heavier the soil, the quicker the vines yield to the attack.

Other vine pests have visited the valley, but have not done much damage. A brown beetle, twice as large as a flea, pierces holes in the leaves, and causes them to drop off. Black-knot is also found. In these valleys it grows under the surface of the ground, but instead of producing a large knot, the root cracks open and a small growth collects along the crack. A large amount of juice is at the same time exuded. The vineyards generally, around the lower part of the valley, are infested.

Mr. S. Wolfskill's vineyard, one and one half miles up Putah creek from Winters, contains one or two acres of vines. The vineyard once comprised forty acres of Mission vines, grown from cuttings from Los Angeles. It was planted in 1851, and in 1861-2 the phylloxera showed itself, after two or three years of heavy mildew. The surviving vines, still infested, have been improving during the last five years. They still have short growth, otherwise they look healthy. Grafted Muscats did well for three years after grafting. The soil is alluvium, mixed with adobe.

Mr. Briggs' vineyard, one half mile south of Winters, is quite badly infested. It consists of one hundred and fifty acres, forty attacked, of which thirty acres plainly show it. The original cuttings came from the Briggs vineyard, near Woodland; later cuttings were grown on the place. The vines are spotted, from a light color to brown, and have not the usual appearance of infested vines. Mr. Briggs has noticed that the carefully manured vines seem to be recovering.

YOLO COUNTY.

The Orleans vineyard, visited September fourth, is situated in Yolo County, about eighteen miles west of Woodland, among the rolling foothills. The growth of vines is very poor; some, twenty years old, are no larger than a three-year old vine grown under good condition of soil and proper cultivation. Not many vines were dying outright, but a gradual decay of the whole hillside of infested vines was noticed. Evidently some condition of soil or climate prevented the insects vigorous working; so they were merely spreading, and increasing very slowly. In the valley, at the foot of the western slope, on the north half of the vineyard, the soil is adobe and badly cracked; here they have destroyed the vines completely. This limit of total destruction follows very close around the foot of the hill. On the north aspect of the same hill the vines are also small. The soil is limy, dry, hard, and compact around the roots, making it very difficult for the insect to move about on the roots. The larger part of the vineyard, toward the house, looks better, but I have no doubt that it, also, is infested. The Orleans cuttings were imported from France. Last Winter the trunks of the vines were stripped of their bark six inches below the surface of the ground, and a strong solution of sulphate of copper applied with a swab. Between five and six barrels of bluestone were used for this purpose with apparently good results; the vines have produced better this year than ever before. Vinehopper and mildew have destroyed the crop on the eastern slope of the hill, in the southern part of the vineyard.

Mr. Gillig's place, near Capay, suffers more from the attack of vinehoppers than any thus far visited. They are at work principally on a low, sandy part of the vineyard. There are, also, almost positive signs of phylloxera, although none could be found upon several vines that were examined. The soil was extremely hard.

Woodland District.

Vineyards southwest of Woodland were visited September 6th. The vineyards that receive proper care are doing excellently.

Through this district the vines are subject to various pests, such as vinehopper, grasshopper, cutworm, army worm, phylloxera, and blight. Black-knot is, also, quite frequently found. The vinehopper is doing considerable damage in a few localities; the remaining pests come and go with but little regularity. Wherever the conditions are favorable for their development, they will be found. In very many cases a small patch of alfalfa is grown adjoining the vineyards, invariably breeding pests for the destruction of the vines. Various methods have been adopted for the extermination of the several insect pests, viz.: by destroying the eggs of the vinehopper; gathering the cutworms and crushing them; allowing turkeys to eat the grasshoppers; and, finally, digging trenches, and lining them with sand, into which the army worm may fall, and afterwards be crushed. Blight is quite prevalent on land that is dry and not well irrigated.

On Mr. R. B. Blowers' ranch, three and one half miles south of town, is a small, almost deserted vineyard, infested with phylloxera. One vine of Purple Damascus, grown from rooting, was affected in 1860; three years afterwards it died. It was an imported vine, sent by Mr. Charles Reed, from Washington. The spread from this point was very slow. It now includes Mission vines. The soil is hard, alluvial ridge soil, leaving sufficient room around the roots for the insects to work freely. They were found in cracks of the roots, about six inches below the surface of the ground. No vines were completely dead A piece of land adjoining the vineyard was planted to vines, but they have been taken up in consequence of decay; it is now sown to alfalfa, and breeds insects in abundance.

PLACER COUNTY.

September 11th I visited Mr. Barrett's, or the old Nickerson vineyard, three and a half miles north of Lincoln. The soil in the low lands, containing an infested spot, is hard, red, and gravelly; moisture about six inches from the surface. The western part of the vineyard is very badly infested. Its soil is formed mostly of fine pieces of granite compactly cemented together. No information could be gained as to how or when it became infested, but judging from appearances it must have been several years ago. Black-knot, army worm, and vinehopper are doing some damage.

Whitney vineyard, six miles east of Lincoln, near Rocklin, contains 189 acres of vines, from one to six years old, apparently not infested. The cuttings came from Coloma and Orange. The soil varies from blue adobe to red land. Blight and drouth affect the vines in some parts of the vineyard. The blight turns the whole leaf spotted, but not very dark colored, as is usually the case. It is more prevalent in adobe soil. Vinehopper is plentiful.

PLACERVILLE DISTRICT, EL DORADO COUNTY.

Visited September 13th. The vineyards generally are neglected, and do not look vigorous and strong. Mr. McCall has a vineyard one half mile east of this town. The lower part, consisting of Mission vines, is very badly infested with phylloxera. Two or three acres were pulled up in the Spring; the soil is much heavier and wetter than that in which the healthy part of the vineyard now grows. The vines are over twenty years old, and have been dying for three or four years. A high ridge passes through the lower half of the vineyard, on either slope of which are large infested spots. The soil is clay, with large pieces of slate intermixed. Upon the hill the slate, standing on edge, projects from the surface of the ground. Some of the vines are doing well on this thin soil. The roots generally are rotting. No other apparent disease. Mr. Spencer, adjoining Mr. McCall, has a spot or two of phylloxera. Blight is quite frequent.

Mr. Hardy has a vineyard one and a half miles south of Placerville, upon one of the highest mountains near the town. The vineyard has excellent cultivation, and produces fine table grapes. A patch of Sultanas grafted on old Mission stocks, look very well with the exception of a small spot infested with phylloxera. This spot is on very strong, red land, covered with convolvulus. On this spot the vines have never been healthy, but have managed to live so that none are now missing. The insect was found on the root, just where the graft was inserted, five or six inches below the surface of the ground. The cuttings came from Mr. Blanchard's, near El Dorado. Mr. Hardy speaks of army worm attacking young grafted vines before the graft is fully established. There are many vineyards south of this place, but I had no time to visit them. I could hear of no disease affecting them.

September 14th was spent in visiting the vineyards near Coloma, Gold Hill, and Uniontown. No phylloxera was found. The vines look neglected; some vineyards near Placerville have been abandoned. Henry Finney's vineyard, four miles west of Placerville, was attacked eight years ago with vinehoppers; this year they are again working on the vines. Army worm did some damage six years ago. The vinehopper is troublesome near Gold Hill; at Uniontown no disease or pests trouble the vines; only some vines planted near old stumps of trees have died. When they are five or six years old the tap-root begins to decay, and becomes infested with a white ant. The surface roots supply nourishment until the taproot rots to the surface, and then the vine dies.

While coming down on the train I saw positive evidence of phylloxera on Mr. Hitchcock's place, one mile south of Dugan Station, El Dorado County. Soil is red land to lowland. There is also a suspicious spot near Folsom.

STOCKTON DISTRICT, SAN JOAQUIN COUNTY.

Vineyards near Stockton were visited September 2d. Here, however, no phylloxera was found, and the vineyards are healthy. The vinehopper is doing considerable damage; some vineyards are comparatively free from them. Tying the canes together over the tops of the vines preserves the fruit to a great extent. Covering the vines with a blanket and burning Milco's insect powder under it kills the insect, but it is too troublesome to be widely used as a remedy. Mr. West's vineyard, nine miles north of Stockton, is suffering greatly from a heavy growth of convolvulus or morning glory, growing so thick that it chokes the vines. The seeds were scattered while the vineyard was flooded when first set out. It checked the growth of the young vines, and is now gradually overcoming the older ones. Dodder has been used as a remedy, but it has not proved very effective. Low wet adobe soil seems to be best adapted to its growth.

Scattering vines are dying from the effects of black-knot. Here it is commonly found on the large roots below the surface of the ground, forming very large knots which bleed profusely, and soon exhaust the vine. A few alkali spots seem strong enough to kill the vine. Blight is quite frequent. It is noticed more particularly on the ends of the canes; those protected from the sun are thus affected while the remainder of the vine is perfectly healthy. If the canes bear grapes they soon wither and turn black. Sulphur has been applied as a remedy with supposed success. It is said to have stopped the spread and checked further decay. Many of the vines upon which it was tried would seem to prove it to be a valuable remedy, but in other localities it has not answered the purpose.

FRESNO COUNTY.

I visited the Eisen vineyard August 24th, and found it in excellent condition, with the exception of spots attacked by the vinehopper. It is situated about three and one half miles east of Fresno.

Mr. Eisen has one hundred and seventy acres of vines, all under excellent cultivation and easily flooded. No phylloxera was found, but portions of the vineyard were very badly injured by the vinehopper—especially Malaga and Riesling varieties.

At Central Colony Mrs. Smith's and Mr. Bannister's vineyards were visited. On the former a few grape worms were found, while the latter had been slightly attacked by grasshoppers of enormous size.

Mr. Gustaf Eisen writes the following regarding pests in his vineyard: "The first year, 1875, we were troubled with large, green grasshoppers, eating the leaves and stems of the bunches. In 1876 we had the red spider, a kind of *Acarus*, drying the leaves, especially on the Zinfandel. The next year, 1877, there was nothing particularly troublesome. In 1878 we had the grape-vine moth, a large sphinx, and picked twenty tons of caterpillars. The next year, 1879, the thrips began at one end, and traveled slowly but surely towards the other; especially infested varieties were the Malaga and Gray Riesling. These varieties did not ripen well; the year before they were the best grape. Finally, this year we have the thrips again, now doing more harm than last year. Again, the Malaga and Riesling are the worst affected, and even the Black Hamburg has been badly hurt. Zinfandel, Malvoisie, and other kinds, are comparatively unhurt."

Mr. W. A. Sanders' place, seven miles east of Kingsburg, was visited August 25th. He makes substantially the following statements regarding his vineyard: "He noticed that his vines were very badly attacked with phylloxera in 1877, and by irrigating with water charged with some substance, whose nature is not given, the phylloxera was entirely exterminated the first year, before he had time to study their habits. The vines attacked were cuttings and rootings; the former were less than a year old when killed; the latter, between one and two years old. All varieties, except Rose of Peru, were infested; among these were Muscats, White and Black Corinth, California, Bishop, Black Morocco, Emperor, etc. The insect was brought on Missouri vines. In the middle of July, 1877, he hatched out some of the winged variety in a bottle, but, not knowing their characteristics, could not identify the infertile kind. He has, in all, a patch forty rods square; vines eight feet apart; 4,000 vines were infested, many of them recovered, but 500 were dug up and have not since been reset. The lower half of the vineyard has lost one half its vines; in the upper part only one third of the vines are missing. There were no places of general "wiping out," only small spots were attacked. Some of his vines were taken from a vineyard, four miles north of Red Bluff, Tehama County, which had phylloxera in 1873, and has since been destroyed, and is now used as a sheep ranch. In the Red Bluff Vineyard, Concord and Rose of Peru varieties were phylloxera proof. No other disease has ever affected his vines."

I could find no phylloxera, nor any signs of its ever having been there. The soil is very sandy, and when irrigated, is soft and mushy.

LOS ANGELES COUNTY.

Vineyards in the neighborhood of Los Angeles and San Gabriel were looking vigorous and healthy. Some were suffering for want of proper irrigation; others, that have been deserted, or neglected for some time, have not since been completely restored. Through some of these neglected vineyards are strips of vines turning yellow, the result of drouth. The strips are on very sandy or gravelly soil.

A complaint, quite common, is caused by the drying up or burning of the leaves, sometimes taking part of the vine. It is supposed to be caused by the hot sun shining on the wet leaves in the morning. It is more probably a disease related to the common vine blight. Vinehoppers were found only in one vineyard. Gophers are quite a source of annoyance. On General Stoneman's place there are two spots where the growth is short and leaves yellow. Upon investigation I found that the taproots had been eaten off by gophers eighteen inches below the surface of the ground. The soil was very gravelly and easily penetrated. Vine pests have never disturbed the vineyards to any great extent. One or two years ago the cutworm infested a few vineyards and injured the crop, but it was soon exterminated by gathering the worms that had collected around the trunk of the vine, and destroying them.

Vineyards near Anaheim were visited on the evening of August 31st, and morning of September 1st. The vines generally are in a good condition. Some of them have been attacked by cutworms, which were destroyed before much damage was done. Grasshoppers damaged the Muscat vines some years ago. These two constitute the vine pests of this region. I noticed, in most of the vineyards long strips and spots where the vines were dying or dead; the old vineyards particularly show it. In one case part of the vineyard had been taken up and replanted. The roots had grown about eighteen inches deep, and struck upon a hard subsoil which they could not penetrate; the surface soil is alkaline. I noticed, in particular, that vines along irrigating ditches, and low, wet spots, are not healthy; and I was told that by irrigation this trouble was increasing. The hot summer, three years ago, dried up these spots; since then the vines have not done so well. I took up some of the roots around one of these spots, and found them in a very poor condition; parts of them were entirely decayed. Vines of large vigorous growth had strong taproots but slightly affected; the smaller roots were all dead. These spots of short growth have been noticed for ten or fifteen years.

Cuttings have been planted on these poor places, but, even after heavy manuring and good cultivation, they proved a failure.

The vineyards around Riverside were visited August 30th. They are few in number and comparatively young; very healthy, with few signs of disease. Vines one and two years old are bearing exceptionally large crops of Muscat grapes. The older vines are not doing so well, possibly caused by overbearing last year. Occasionally vines are "dried up" or suffering from blight, especially those that were pruned high and not well covered with foliage. Portions of the bunches suffer badly, while the remainder is in perfect health; the leaves are not much affected. The burning was supposed to be caused by mildew first injuring the grape, and then the sun completing the damage. Sulphur was freely used to remedy this evil, but no change resulted from it. I saw no trace of mildew. Black-knot and a few vinehoppers are scattered through the valley.

Mr. Daly has a vineyard one and a half miles west of Riverside. The vines are old Mission vines, thirty-five years old, and look very badly. The soil is very sandy and moist; in spots it is covered with a heavy efflorescence of salts, which is strongly alkaline.

MISSION SAN JOSÉ, ALAMEDA COUNTY.

Mission San José, September 24th.—The vineyards here appear to be free from insect pests of every kind. With the exception of mildew and blight, which is common through this district, the vineyards are doing well. The cutworm made its appearance in the Spring, a few years ago, but is doing no damage now. Mr. Ellsworth, who was once connected with the Buena Vista vineyard, Mission San José, says the Mission vines are failing. He thinks the cause is long continued mildew. It began several years ago, and is spreading. The vines, when first affected, do not produce a full crop; each successive year the grapes diminish in size, until the berry, when fully matured, is no larger than allspice, and very black. The vines seem to do well, until this blight strikes them also, and then they dry up, and the leaves drop off. In other cases the grapes remain green, and do not shrivel, although the vine may lose its leaves. Canes are of moderate length, though not numerous. The blight is first shown by the leaves turning brown; a part or the whole leaf may be thus affected. Mr. Ellsworth says he has seen this mildew begin in the corner of a vineyard, and spread until the whole vineyard was not worth cultivating. Cultivation seems to increase the rapidity of spread. He cites instances where vineyards, under good cultivation, were failing; when they changed hands, and poor cultivation was introduced, grass and weeds nearly covering the vines, good grapes were again produced.

Near the Mission is a vineyard under charge of Mr. Merritt, containing a small patch of Grey Rieslings, with short, or at least, not a healthy growth. Adjoining this is a patch of Black Pineaus, with Black Malvoisie intermixed. The growth is short; leaves small, with light color; ends of the canes turning black, as if frost-bitten. Often the blighted vines bear fully matured, large, ripe grapes. All the vines are not affected equally. The soil is black alluvium to adobe, not very deep, and moist nearly to the surface. I dug around several vines and found the roots healthy. Cutworm has troubled the vineyards to some extent.

Father Kaiser and M. Sigrist have vineyards slightly affected with blight. In the latter vineyard twenty-six vines in a single spot are sick. He has noticed this sickness before, but has paid no attention to it, as the vines are perfectly healthy the following year. Up the hill from Mr. Sigrist's, the vineyards are about the same.

At Warm Springs, two miles from the Mission, vines are similarly affected. Muscats are slightly blighted.

SANTA CLARA COUNTY.

Vineyards south and west of San José were visited September 25th. Mr. Lefranc's vineyard, six and a half miles south of the city, is very badly blighted; has oidium, and was once slightly troubled with caterpillars. Oidium appears as a white, floury, substance on the vines and fruit; sometimes a number of vines in a spot are thus affected. It appears about the first of July, and can be prevented by the timely use of sulphur. Two years ago, Mr. Brennam's vineyard was almost destroyed because he did not use sulphur. The blight or "rust," as he calls it, appeared in 1874, and has continued up to the present time. This year there is more than ever before—amounting to one eighth of the crop among Mission vines. Four years ago there was more than during any of the preceding years. It appears mostly among Mission vines, attacking healthy as well as sick ones. Soil seems to make no difference.

On the morning of the 15th of July, 1879, he had not seen the rust, but in the afternoon it was plainly visible. The vines were in blossom at the time, and all the grapes were destroyed. It comes on very suddenly between ten A. M. and three P. M. A single day is time enough to ruin a whole vine. Nearly all the damage is done within two or three weeks, especially if the weather be hot, and the atmosphere sultry. The vines are generally scattering and left in a poor condition, with unripe wood. The disease seems to commence later each year. Mr. Lefranc informs me that vineyards along the foothills, and two or three miles west of his place, are similarly affected. Stockton Brothers, near Mr. Lefranc's, have Mission vines very badly attacked by blight. When it attacks the grapes while green, it often blackens just one half the berry. If attacked while very small, the grapes dry up on the vine. Any portion of the bunch may be blighted and the remainder left in a healthy condition. Mr. Barstow's vineyard, near the Infirmary, is very healthy and but little blighted. Other vineyards in this neighborhood are somewhat blighted; otherwise they are free from disease. Mr. Pierce, at Santa Clara, has an excellent vineyard free from all disease.

Respectfully submitted,

F. W. MORSE.

UNIVERSITY OF CALIFORNIA,

COLLEGE OF AGRICULTURE.

SUPPLEMENT, NO. 1,

TO THE

REPORT OF THE BOARD OF REGENTS.

THE PHYLLOXERA OR GRAPEVINE LOUSE,

AND THE REMEDIES FOR ITS RAVAGES.*

BY EUGENE W. HILGARD,

Professor of Agriculture in the University of California.

The name Phylloxera,† meaning leaf witherer, was originally given to a kind of plant louse which infests the European oak. We are now acquainted with sixteen species, of which only one, the *Ph. vastatrix*, of Planchon, affects the interests of man. The study of the others, however, has materially assisted in ascertaining the habits and life history of that one important species, which forms the subject of the present paper.

It was first observed in America in eighteen hundred and fifty-six, by Asa Fitch, of New York, on the leaves of native vines, and by him named *Pemphigus vitifoliæ*. Other names were subsequently applied by other observers to its various forms, until, about the year eighteen hundred and seventy, their identity was demonstrated by Lichtenstein, Riley, and others.

All the earlier names and descriptions refer to the leaf-inhabiting and winged form of the insect.

The Root Rot or "*Pourridie*" of the vines, first mentioned as existing in France about the years eighteen hundred and sixty-five and six, was shown to be due to wingless lice, in eighteen hundred and sixty-eight, by Planchon. But the identity of these root lice with those inhabiting the leaf-galls of certain native American vines, was for some time not even suspected. After attention had been called to their close resemblance, and to the fact that the Leaf Gall Louse descended to the root in winter, attempts were made, both in this country and in Europe, to transplant root lice to the leaves; many of which were unsuccessful, in consequence of the failure of observers to select suitable varieties of vines. Finally, in eighteen hundred and seventy and eighteen hundred and seventy-one, Riley conclusively proved the identity of the two types, by effecting the change of habit either way, on vines properly selected. He also showed that the all but universal failure of the European vines, as well as that of certain delicate native varieties in the Mississippi Valley, observed long since, was due to the attacks of the Root Louse.

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* Revision of "A Lecture on the Phylloxera or Grapevine Louse, delivered before the State Vinicultural Association, at San Francisco, November twenty-third, eighteen hundred and seventy-five," and forming Bulletin Number Twenty-three of the University of California, issued in January, eighteen hundred and seventy-six.

† Pronounced as if spelled *fillo-xee-ra;* emphasis on *xee.*

When, six years ago, I first examined the diseased vines in the Sonoma Valley, I was forcibly struck with the fact that I had handled vines precisely so circumstanced, thirty years ago, when my father, among the first, attempted the culture of Rhenish grapes in southern Illinois.

From eighteen hundred and seventy, up to this time, the Phylloxera has spread in France with frightful rapidity, destroying wholly or partially thousands upon thousands of acres in the vine-growing districts. In eighteen hundred and seventy-one, the French Academy appointed a standing Phylloxera committee, whose reports and discussions often occupy a large portion of the weekly session. A prize of, first, thirty thousand, then sixty thousand, then three hundred thousand francs, has been offered for the discovery of an effectual and practicable remedy. But although hundreds have been brought forward, the prize has not yet been awarded. Meanwhile the existence and ravages of the insect have become obvious in Germany, Austria, Italy, Portugal, and Spain. Universal alarm has been created in these countries, and the literature of the subject has become exceedingly voluminous.

In eighteen hundred and seventy-three, the French Government sent Planchon, a prominent scientist, to observe the Phylloxera in its native haunts in the United States; it being now considered certain that the insect is at home on native American vines—which it does not materially damage in their wild condition—and has been imported into other countries with them. Planchon's observations and reports have fully confirmed, in all essential points, those previously made by Riley and other American observers. Riley's observations, published chiefly in the reports made by him as State Entomologist of Missouri, are by far the most complete and reliable made in this country; and to his publications I am largely indebted for the material, and for the illustrations of the present paper.

DESCRIPTION OF THE PHYLLOXERA.

In most respects the Phylloxera resembles the common plant lice (*Aphis*), the main difference being that its wings lie flat, and overlap on the back, instead of being erected roof-fashion; and that the three-jointed antennæ have the terminal joint much the longest. All are quite small, the perfect winged form of the Vine Louse being about one twentieth of an inch in length. Its peculiar feature is the great variety of forms which it is capable of assuming under different circumstances. Among them we distinguish two chief types, viz: the leaf-inhabiting one or Gall Louse, and the root-inhabiting or Root Louse.

THE GALL LOUSE.

The Gall Louse habitually infests the leaves of certain native grapes in the Eastern States, especially those of the Riverside and Frost Grape (*Vitis riparia* and *cordifolia*). It covers the surface of the leaf with numerous fleshy swellings, of irregular shape, and often partially of a reddish tint. In them we find a wingless female louse, one twenty-fifth of an inch long.

Fig. 1.

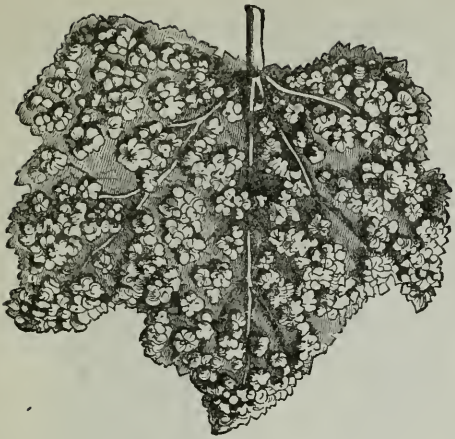


Fig. 2.

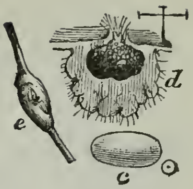
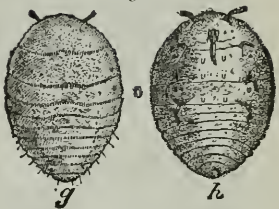


Fig. 3.



The Gall Louse. Fig. 1—Vine leaf covered with galls. Fig. 2—Section of a gall and egg. Fig. 3—Mother gall louse.

When the gall is filled with from two hundred to five hundred eggs, the mother louse dies. The eggs hatch in from six to eight days into active little larvæ, of oval form, which soon leave the gall, go to the upper surface of downy young leaves, and insert their suckers. The latter consist of three fine threads, surrounded by a blunt and hairy sheath. The leaves soon begin to swell below, while a reddish down surrounds the louse above, gradually closing in. On suitable vines, the gall forms in a few days, and the grown louse begins to deposit eggs, fills the gall, and dies. The young lice not only attack the leaves, but also cover the tender shoots, and even the tendrils, with swellings.

It has been calculated, that at the rate of five hundred eggs in each gall, the progeny of five or six generations would, if placed end to end, reach thirty times around the earth; but under ordinary circumstances so few survive that the damage done is comparatively trifling, and readily prevented by early attention.

Towards the end of September the galls are mostly empty, the lice having gone to the roots to hibernate.

THE ROOT LOUSE.

The life history of the root-inhabiting type of Phylloxera is much more complex than that of the Gall Louse.

Fig. 4.

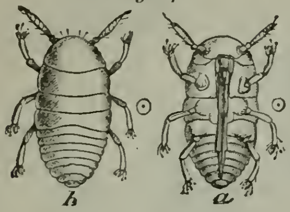


Fig. 5.

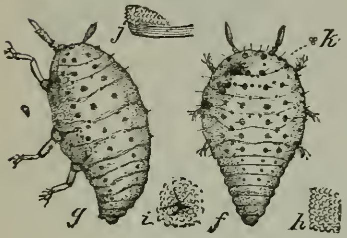


Fig. 6.

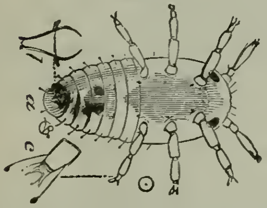
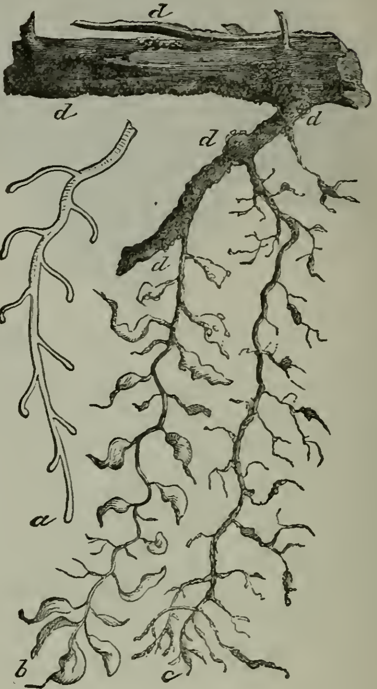


Fig. 7.



The Root Louse. Fig. 4—Young larvæ. Fig. 5—Adult (egg-laying) larvæ. Fig. 6—Male insect Fig. 7—Vine root, with colonies of eggs and insects on main root; sound rootlet; rootlets with swellings; dead rootlets; black.

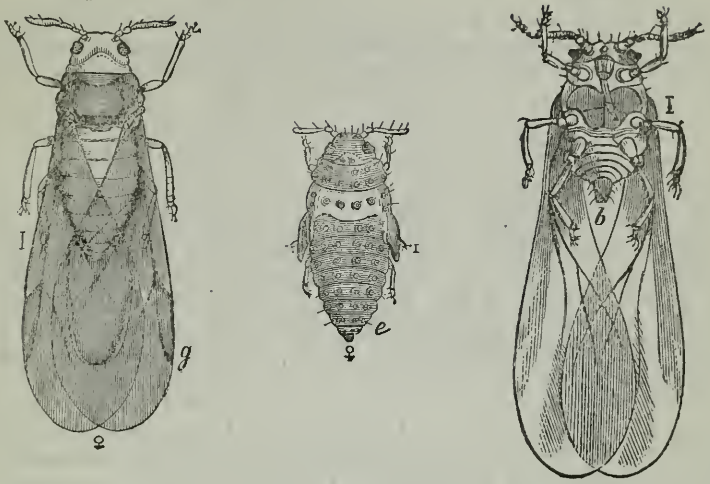
The newly hatched larvæ of either are alike. Those of the Root Louse soon acquire tubercles over their surface; these, however, are irregular, only skin deep, and sometimes absent. As the development progresses, two forms begin to differentiate themselves. One is of a somewhat pointed egg or pear-shape, and resembles the wingless Gall Louse; the other is of an oval form.

The former is the mother Root Louse; it remains on the root through life, sucking its juices, locating itself and its colonies by preference in crevices, creases, etc. At maturity, without sexual impregnation, each lays upwards of two hundred and fifty eggs, which on hatching again rapidly go through the same round of life.

THE WINGED FORM.

The oval form of the Root Louse larva is destined to become winged.

Fig. 1. *Fig. 2.*



The Winged Phylloxera. Fig. 1—Fertile variety, long-bodied; *e*, young insect with wing-pads. Fig. 2—Sterile, short-bodied variety.

From the time it has achieved one third of its growth, the wing pads, or rudimentary wings, are visible. The individuals are more active than those of the wingless form, and are often seen crawling about; finally, in July* and August they shed their last skin, and take wing. The winged form has neither tubercles nor granules on its back. All are females; a supposed male form, with shorter abdomen, proves to be merely a barren female. The perfect ones deposit from two to eight eggs where they alight, and then perish.

The eggs are of two kinds: the larger, about two hundredths of an inch in length, are of the female sex; the others, about two fifths smaller, hatch into males; the time required being about a fortnight.

The sexual individuals thus produced are again wingless; more than that, they are destitute of sucker, mouth, or alimentary canal, being evidently destined exclusively for the reproduction of their species. They are quite active and couple freely.

These sexual females lay but one single egg apiece. This solitary egg, which is destined to hibernate, and hatch in Spring, produces again the ordinary mother Root Louse, which lays several hundred eggs, and is capable of repeating itself without sexual impregnation, for five or six generations.

So far it would seem as though the production of the winged form at intervals were necessary for the renewal of the vigor of the species; and that, if its appearance could be prevented, or itself or its brood be destroyed, the Phylloxera might be almost exterminated.

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* About that time there is usually a marked increase in the number of the insects, known as the "July invasion" in France.

Unfortunately, other observations have shown that nature has provided against the possibility of thus getting rid of the pest. Under circumstances not fully understood, the ordinary form of Mother Louse also at times performs the office of the sexual females, and lays the large solitary egg which is necessary for the rejuvenation of the insect.

Such multiplicity of forms, of provisions for the perpetuity of the species, combined with such elasticity of habit, is not thus far known to exist in any other insect; albeit similar transformations have been observed in the species that inhabits the oak.

IDENTITY OF THE GALL AND ROOT LOUSE.

The identity, and convertibility into each other, of the two principal forms of Phylloxera, were long doubted. This was especially the case in Europe, where the conditions of the change of habit did not then exist. Many attempts to transplant the Root Louse to the leaves failed; which is not surprising, when we consider that, as Riley showed, the insect does not form galls readily even on the Clinton vine, after having lived on the roots of other varieties for several generations. The leaves of the Clinton, and of its wild ancestor, the Riverside Grape, seem to be best of all adapted to the taste of the Gall Louse. In the South I have seen whole arbors of the Frost Grape (*Vitis cordifolia*) thickly covered with galls, so as to prevent its bearing altogether. Its roots, however, are scarcely at all infested during the growing season, but only serve as a retreat for hibernation or wintering.

On grape varieties whose leaves are not to its taste, the Phylloxera either forms no galls at all, or abandons them after making a trial, leaving "abortive" galls. In some cases it has been found living under the bark, above ground. Koehler (at Kloster-Neuburg), and Balbiani, succeeded in making the Root Louse live on the under surface of the leaves, in the third generation. The fact that the habits and mode of development of the insect depend very largely upon the nature of the vine, so that it will refuse to live on the *leaves* of some varieties, and decline the *roots* of others, is the key to the whole mystery of its changes of habit, whose importance was first fully shown by Riley. The failure to take this important consideration into account, explains the wide divergence in the results and conclusions of different observers and experimenters. More than this, it furnishes the most important cue to the prevention of the ravages of the insect in the vineyards of the future.

On the European vine (*V. vinifera*, which includes the Mission grape of California), leaf-galls have scarcely been known to be formed; the attacks of the insect are altogether directed against the roots. The exact reverse is true of the native Riverside Grape of the Eastern States, from which the Clinton and related varieties are derived. Of the other American varieties, those descended from the Fox Grape (*Vitis labrusca*) of the Atlantic States, such as the Catawba and Isabella, are most liable to the attacks of the Root Louse; while those derived from the Summer Grape (*V. Æstivalis*), such as Norton's Virginia Seedling, as well as the hybrids, differ greatly in these respects, each requiring special experiment in different localities and climates, to determine their nature and powers of resistance.

The Gall Louse is found occasionally on most of the grape varieties cultivated in the Eastern States. When placed on uncongenial foliage it descends to the roots. It was from the progeny of such lice that Riley obtained galls on the Clinton vine, which, with the Taylor, is most liable to its attacks. As, however, it refuses to live on the leaves of the European vine, it is scarcely known in France, save on imported American varieties.

THE SPREAD OF THE PHYLLOXERA IN EUROPE.

Since the Gall Louse never acquires wings, it can spread but slowly, by crawling. The same is true of the Root Louse, so long as it does not assume the winged form. It then migrates through crevices in the soil, or along the roots; or even over the surface of the ground, provided that the latter be not too sandy. Being unable to travel over or through sand, its development and progress is so checked in sandy regions as to render it almost powerless for harm. This circumstance explains the fact that such regions have enjoyed almost complete immunity when adjoining ones were overrun with the plague. It is doubtless from this cause that the European grape has been successfully cultivated in the coast region of the Gulf of Mexico, while it has totally failed on the more generally clayey soils of the Western States.

But the matter assumes quite a different aspect when the winged form makes its appearance. It is not known what percentage of the Root Louse progeny assumes this form under ordinary conditions; but it is certain that, at times, the winged insects appear in countless numbers in July and August. They do not seem to possess great powers of flight, but are so light and the wings so large in proportion to the weight, that the lightest breeze carries them along with ease. As to the objective point of their voyage, they do not seem to exert much selection, and the question as to the particular locality where the eggs are ordinarily intended to be deposited, has been much discussed. It is certain that, after alighting, they seek to lay their eggs in some furzy place, such as buds, or woolly leaves, or their axils, etc., since the eggs appear to be deposited indifferently in any such spot, whether on a vine or any other plant or tree. It is thus obvious why the spread of the insect has been so much more rapid in France—where vineyards extend uninterruptedly over extensive tracts—than in America, where they are mostly separated by intervening screens of woodland, on which large numbers must alight in their random flight, and, of course, perish for want of suitable food. This circumstance conveys an important hint in regard to the prevention of the spread of the insect. But it is also obvious, from the facts just quoted, that the eggs may be conveyed from one place to the other, both in cuttings and in the material used for packing, as well as in numerous other ways. It is true that, under ordinary circumstances, the eggs hatch within a fortnight; but should cold weather supervene, they may remain dormant, as do the eggs deposited on the roots by the last generation of mother lice, which, together with the larvæ, constitute the hibernating reserve. In such a case, of course, the insect would be ready to revive and flourish wherever the cutting should happen to be planted; and it is doubtless in this manner that it has found its way into many a vineyard, and even across the sea.

The larvæ wintering on the roots are of a dingy color, and not easily seen; they are attached to the roots by strong suckers. Early in spring they revive, the eggs hatch, and the uninterrupted round of generation is resumed.

INJURY DONE TO VINES.

The injury ordinarily done by the Gall Louse is comparatively insignificant, or easily rendered so by a little early attention—clipping off and destroying the infested leaves. It is only when neglected until it has developed for several generations, that it passes beyond control, and materially injures the crop on such varieties as are favorable to its development.

It is quite otherwise with the Root Louse, whose presence is usually unsuspected until it has seriously injured one crop at least, and which, in any case, it is most difficult to reach.

The first effect produced by the attack of the louse is a swelling of the tender white rootlets, which it prefers to the older and harder portions. In the center of these rounded, semi-transparent swellings, the puncture may be seen as a minute black dot, from which the rot commences after the insect deserts it for a new position. It has been thought that this prompt decay is induced by a secretion that the animal injects into the wound; but it is more probably due to the inability of the deformed rootlets to undergo the normal process of transformation into dark, woody root fibers.

As the invading army moves on, root after root is left behind to decay. During the first year, the vine usually shows but little appearance of disease, save that the fruit is slow to ripen, or matures but imperfectly. The lice being chiefly on the outlying rootlets, simply arrest the normal increase without harming the vitality of the vine.

During the second year, the enemy rapidly approaches the center, destroying all the finer rootlets. The vine appears sickly, with stunted, yellowish leaves, and fails to mature fruit.

Some of the weaker vines succumb, so as to fail to put out leaves the third year. The stronger ones hold out through the season by the aid of two or three remaining roots, from the fact that the Root Louse, being somewhat dainty in its feeding, deserts a dying vine before it is completely exhausted, for "fresh fields and pastures new." This fact, the significance of which has been confirmed by direct experiment in France, shows that a weak or diseased condition of the vine is not, as has been supposed, a determining cause of the attack; since the Louse prefers vigorous vines whenever it has the choice. Of course, however, a weak and old vine ordinarily succumbs sooner than a strong and young one; and hence in the case of vines not constitutionally very well adapted to the nature of the Root Louse, the mere strengthening of its vitality by means of proper manures is sometimes sufficient to keep them in profitable bearing.

The fundamental importance of a judicious selection of vines with regard to their resistance to the Phylloxera, is thus obvious.

Unfortunately, up to the present time, nearly all the grape varieties planted in California belong to one of the most sensitive species—the "Old World" (*Vitis vinifera*). It is true that some of these are somewhat hardier than others; but none has so far shown any such degree of resistance to the Phylloxera, as to do more than to prolong the life of the vine for a few years. The claim advanced by some that the Mission grape is resistant, is based upon a confounding of the Mission with the wild native vine of California, which indeed appears to be as indifferent to the attack of the insect as any of the wild grapes of the East. Other things being equal, the Mission vine is found to succumb about as readily as any other.

The sweeping destruction that has followed the invasion of the French vineyards by the Phylloxera, is a matter of notoriety, and the sorrowful record need not be detailed here. When its presence was first recognized in the Sonoma Valley, it was naturally supposed that in a climate apparently so favorable to the development of the insect, its progress would be at least equally as rapid as in Europe. But from some cause not yet understood, its advance, though steady and inexorable, has been comparatively slow. Instead of twenty or thirty miles annually, its outposts have advanced only two or three, and sometimes much less, in each year. Again, while the ultimate fate of vineyards has been the same as everywhere else, and in the Sonoma Valley especially, hundreds of acres, once covered with vines, have been converted into wheat fields: yet on the whole it appears that the work of destruction has required a longer time; that the vines have continued in profitable bearing two and even three years after the first attack, when growing on strong soil, and well cultivated.

The last mentioned difference may be accounted for by the comparative youth of the vines, and the freshness of the soils. But the slow advance made by the insect requires some explanation, not yet fully found in the facts thus far observed. I was indeed led to hope that the winged form, through which chiefly the rapid diffusion of the pest is accomplished, might not be produced at all in California. Observations made during the present season have shown this hope to be fallacious, at least in so far that a considerable number of winged individuals was produced from infested roots brought from Sonoma, inclosed in jars filled with earth, under the care of Dr. J. S. Hyde, of Santa Rosa. Of these, a large proportion, especially of the earlier broods, was found to be of the short-bodied, and presumably infertile variety, figured above (p. 7).

Observations made somewhat later (in September), by residents of the Sonoma Valley, have failed to reveal the presence of the winged form in the vineyards, and it still remains true that it has not as yet been seen abroad in California. And while there can be little doubt that closer observation, earlier in the next season, will reveal its presence in the open air, yet the presumption remains, that the production of the winged form, and the spread of the plague through its agency, is in some way limited in the Californian climate, whether simply as regards its numbers, or through the predominant production of the sterile variety, during the season when the regular winds would be most likely to carry the minute flies to great distances. Were the winged form produced, at any season, in such numbers as have appeared elsewhere, their presence could hardly have remained unnoticed by the many persons who have been looking for them during the past two years.

Be that as it may, the unquestionable fact remains, that since the insect spreads much more slowly in California than in France, it must be to that extent easier to check its progress; and that we may succeed in doing so through means that have proved too expensive elsewhere. What these means are, I now proceed to discuss.

COMBATING THE PHYLLOXERA.

The problem to be solved in combating the Phylloxera is a difficult one, not because of any tenacity of life in the insect itself, but simply on account of the difficulty of *devising any means that will reach every one of the matted rootlets of a vineyard, over its entire surface, and to a depth of from three to four feet;* with the additional conditions that *the remedy must be cheap, not only as regards the material, but also the work of application, and must not injure the vine materially.*

It is perfectly easy to devise thousands of compounds that will kill the insect, which is soft, jelly-like, and a few days after death is only represented by a thin, empty membrane hanging to its sucker. It is not nearly so easy to kill the eggs, which is of course of equal importance. Almost any substance or operation energetic enough to kill the eggs, will hurt the white rootlets more or less; and it is on these that the living insect is usually found in the greatest abundance, while the eggs are by preference deposited on older roots, whose bark and crevices afford them more protection. *Both, and all of them,* must therefore be reached if the insect is to be extirpated. The depth to which the roots reach varies with the soil and location, but is rarely less than three feet. In rows eight feet apart, the white roots usually interlock between the rows, so that the insect can migrate from one row to another without going above ground.

Next to air, the cheapest medium for saturating the whole soil of a field to the minimum depth of three feet, is WATER; and the most obvious method for the destruction of the Phylloxera is, therefore,

I.—SUBMERSION.

I have already stated that the prize of the French Government for "an efficacious and practical remedy" for the ravages of the Phylloxera has not yet been awarded. Several of the remedies suggested fulfill one of these two indispensable conditions, and for a not inconsiderable class of localities, submersion fulfills both; but it must be applied to the infested vines for a sufficient length of time; *i. e.,* for not less than thirty days in autumn, or even forty in winter. Wherever this can be done at a reasonable cost, the Phylloxera may be defied. The remedy, of course, is available to a limited extent only; yet it has been applied, in France, in localities where steam irrigating machines had to be constructed for the purpose—because of the high commercial value of the product of particular vineyards.

The great length of submersion necessary to destroy the Root Louse and its progeny (as ascertained by experiment), renders it indispensable to perform the operation while vegetation is in abeyance. It is found that submersion during the growing season, for a longer time than three days, materially injures the vine, while it does not sensibly interfere with the well-being of the insect. At the same time, whenever the latter has assumed, or even approached, the wintering condition, it is prepared for the conflict with the elements, and much more difficult to destroy. The sooner after the cessation of vegetation, therefore, the operation of submersion can be performed, the shorter will be the time required to exterminate the enemy. In pervious soils, also, the effect will be produced in less time; showing that the reason why it takes so long to kill the louse is not so much its ability to resist drowning, as the circumstance that it takes a much longer time than is usually supposed, to fill the soil with water.

In general, nevertheless, wet is decidedly injurious to the Phylloxera. It is less troublesome in wet soils, and wet seasons sometimes check its progress materially. In connection with this point, it is important to remark, that experiment has shown light soils with a wet subsoil not to be as unfavorable to the vine as has often been supposed. The fact that several of our native vines are originally found on such soils only, naturally points to this conclusion, as well as to the grape varieties most likely to succeed in low ground. That such localities are most readily submerged, in case of need, is an additional weighty reason for locating vineyards on them, provided, of course, that the production of high quality wines is not intended.

It would thus seem that the climate of California is exceptionally favorable to the rapid increase of the Phylloxera. Even our wettest winters cannot drown out the hardy eggs and hibernating larvæ. On the other hand, our long dry season, which never fails, offers the insect a chance for uninterrupted development and indefinite multiplication, such as is scarcely to be found elsewhere. Add to this the circumstance that our prevalently heavy soils afford it additional advantages, by the facility with which it can travel from vine to vine and from vineyard to vineyard, through the crevices of the suncracked surface, and we have a concatenation of advantages on the side of the insect which warns us that, unless vigorous preventive measures are taken, the vineyards of the State must all ultimately succumb to its attacks.

II.—SANDING.

It has been proposed to employ the inability of the insect to travel or flourish in sandy soils, as a means for its destruction. But, plausible as this seems at first sight, it lacks the essential feature of practicability on any but a very limited scale. To merely surround the stock with sand, may close to the insect this very convenient outlet; but it will not in the least interfere with its crawling to the surface through crevices elsewhere, nor stop its underground communication, through suncracks, and along the roots which interlock between the rows. Unless, therefore, the application of sand is carried to the extent of actually converting a heavy soil into a sandy one, but little good can be expected of it. That the expense of this operation would, in the vast majority of cases, be an effectual bar to its application, scarcely requires discussion; still it should be kept in view, since at times a mere diversion of the drainage may be sufficient to effect a beneficial change in the course of time. At all events, the principle may find an important application in circumscribing the spread of the wingless form, by means of ditches filled with sand.

It has been proposed in the volcanic districts of southern France, to replace the mere arid sand by the volcanic sand or ashes, which can be readily obtained in many cases, and would, by its gradual decomposition, supply valuable soil ingredients, or plant food.

The same objection that lies against the efficacy of sand placed around the stock of the vine only, applies equally to other impediments put in the same place: such as plaster cast around and smeared with tar or other sticky substances; or tarred sawdust similarly applied. The Root Louse, wingless or winged, may choose this as an easy route when it is open; but with its usual fertility in resources, it finds other outlets without much trouble, when that one is closed.

III.—INSECTICIDES.

The fact that any measures intended for the repression or destruction of the Phylloxera must, in order to be effective, extend not only over the entire surface, but also into the depths of the soil as far as the rootlets of the vine reach, renders the use of insecticides, or poisons of any kind, both difficult and expensive of application. An immense number of these have been proposed, but a few only have proven of any practical value; partly because of the expense attending their use, partly from the liability of the most effective ones among them to injure the vine as well as the Phylloxera, unless used with great caution.

A list of all the remedies proposed would be a long one, and at the present time of interest only in so far, as it would show to inventors what has been already tried and found wanting. The essential conditions above enunciated, that any effective remedy against the Phylloxera must admit of being applied over the entire surface, and to a depth practically equal to nearly three feet, within reasonable limits of expenditure, at once throws out of consideration all but the cheapest materials, or those capable of being readily diffused throughout this great mass of soil without losing their efficacy. The many mysterious compounds, powders, etc., proclaimed from time to time as "Sure to kill the Phylloxera and not injure the vine," are but a few of many thousands of such that could be devised for the purpose, but no more practically useful than the well-known flea remedy, which was to be applied to the insect held firmly between the thumb and forefinger, compelling it to open its jaws for the introduction of the poison.

Insecticide Solutions.

Water naturally suggests itself as the cheapest vehicle through which a soluble insecticide can be introduced into every particle of the soil-mass to be treated. To a certain extent this principle can be usefully acted upon, and yet it is practically much less available than would appear probable at first blush. It has already been stated that when the ground can be kept flooded for a sufficient length of time, the Phylloxera can be, if not extirpated, at least kept in check, so as to be harmless. In such cases no insecticide, properly so called, is needed. When, on the other hand, a quantity of water sufficient to saturate so large a mass of soil has to be put on the ground by artificial means, and at the same time charged with a more or less expensive insecticide, the cost readily becomes such as to exceed the value of the vineyard. This is largely due to the fact that the soil is a powerful absorbent of almost all substances soluble in water, thereby rendering them inactive toward animal life, for the time being. The same disinfecting property of soil that enables it to purify the foulest water filtered through it, without itself becoming offensive, also serves to render ineffectual a large proportion of any poison that may be introduced in watery solution. It is only after the soil has become saturated with it to a certain (very variable) extent, that a remaining portion can become effective. Hence, the amount needed of any insecticide, when used in the soil, is very much greater than that which would be required if water were to be applied to the insect directly. A solution of carbolic acid, or a tea of the "Persian insect powder," that would be instant death to an insect sprinkled with it, becomes inodorous and harmless when filtered through a few inches of soil; and the same is more or less true of all kinds of poisons.

Again, it is quite useless to propose to "bare the roots of the vine" for any insecticide application on the large scale. In a bearing vineyard the roots and rootlets form one matted mass all through the soil over the entire field, and it is at the remote ends that the insect forms its largest and most flourishing colonies. To bare all these is practically impossible, and would in any case involve an amount of labor incompatible with the profitable maintenance of the vineyard; especially if, in addition, the insecticide is to be carefully applied to all, and soaked in with water, as is mostly suggested by the proposers of such impracticable schemes.

Gases.

The use of poisonous *gases* to be generated from substances introduced into the soil in small quantities was early suggested, and was followed up by the use of compounds capable of producing a slow generation, especially of sulphuretted hydrogen; a gas readily produced from cheap materials, and instantly fatal to insects, even in minute quantities. Its effects on the latter proved to be all that could be desired; but it was found to be almost equally fatal to the vines themselves, and was, therefore, soon abandoned. The same was found to hold true in regard to phosphoretted hydrogen and several other gases, whose cost alone would exclude them from use on the large scale.

Bisulphide of Carbon.

In the industrious search for a gas or vapor that would kill the insects without materially affecting the vine, the *bisulphide of carbon* was early experimented upon. This substance is cheaply made by burning charcoal in sulphur vapor, in red hot iron or earthenware vessels. The vapor formed is very heavy and volatile, and requires very effectual arrangements for condensation. When *pure* it forms a colorless liquid, about one fourth heavier than water, of an aromatic and somewhat peppery odor, which is not disagreeable, and produces somewhat the effects of chloroform on the human subject, but acts as quick as poison when inhaled by small animals. Ordinarily, however, it is contaminated with other sulphur compounds, which give it the offensive odor of rotten eggs and onions; and in this condition it is poisonous when inhaled, not only to animals, but also to man. The very offensiveness of its vapor, however, is an excellent safeguard against accidents from poisoning. It is highly inflammable, and its vapor, when mixed with air, explodes, like that of petroleum spirit or alcohol. Since it boils but a little above the temperature of the hand, it evaporates very rapidly when poured on it, producing a feeling of intense cold; when poured on damp earth, the latter soon freezes and becomes covered with hoar frost. The vapor so formed is three times heavier than air, and flows down visibly, like water, from the mouth of an open vessel containing the liquid. It is not sensibly absorbed by water, but like all other vapors is condensed, and held to a considerable extent, by dry earth.

In the experiments at first made with this substance (which is used on the large scale for the extraction of sulphur from its ore, and of oils from oil-cake) it was found that, while it is very prompt in its action on the Phylloxera, it is also liable to injure and even kill the vine roots. For some time its use in the pure form was thought to be impracticable, and efforts were made to use it in its watery solution, in combination with potash—the so-called "sulpho-carbonate" of potash. This method was measurably successful, and in some cases is still considered the best mode of application. But here, again, the necessity of using water to saturate so large a mass of soil proved a serious stumbling block, since it added to the already larger first cost of material, that of labor; to so serious an extent that the method could only be used to save very valuable vineyards.

Returning to the direct use of bisulphide of carbon, it was soon discovered that there is a certain measure of dilution of the vapor, within which it is practically without any effect on the vine, while still fully accomplishing its mission against the Phylloxera. This measure has now been ascertained by long and elaborate experiment; and by means of simple appliances that can be used by any intelligent laborer, the measure and mode of application of the liquid bisulphide to the soil of the vineyards can now be so gauged as to accomplish any desired object, from the mere repression of the insect while the vine is kept in bearing (culture treatment), to the complete extermination of both insect and vine. The latter course may be advisable when infested spots first show themselves in vineyards, with a view to stamping out the pest altogether. The former measure will, as a rule, be adopted, where the infection has already become general, and the choice lies between it and the entire loss of the vineyard in the course of a few years. Experience in France has shown that, when taken in time, the evil may be kept in abeyance at a comparatively trifling cost, by the use of the bisulphide, without interrupting the bearing of the vines. When farther advanced, the loss of one or several crops will result, even though the vines may be saved; but there is a certain point beyond which it will pay better to replant and protect the young vines, than to attempt to rehabilitate the old ones.

Rules to be Observed.

To accomplish these results, however, it is necessary to adhere strictly to the rules given as the result of the best practice, with only such modifications as may be commanded by the varying nature of the soils. These rules may be briefly formulated as follows:

I. The application of the insecticide must be made only when the soil is fully moist, though not water-soaked. In dry soil, and in the dry and warm season, the vapor is rendered inert, partly by absorption in the immediately surrounding soil mass, partly by evaporation to the surface. Moist soil absorbs the vapor but very slightly. In it, therefore, it can spread farthest, and is best protected from surface evaporation. To avoid the latter, also, the soil should not have been recently tilled.

The failure to observe these fundamental conditions of success, has been the most frequent cause of disappointment, and has led to a current notion that the treatment is inapplicable to dry climates like that of California and the south of France. On the contrary, the most emphatic reports of complete success now come to us from the Mediterranean departments of France, whose climate most closely resembles ours.

II. Since it is the succulent white rootlets that are most liable to suffer from the effects of the insecticide vapor, the application is best made after these rootlets have hardened, in Autumn or in Winter, or before they have developed, in early Spring; even though, at these times, the hibernating and most hardy generation of the insect has to be dealt with.

III. For the culture treatment, the carbon bisulphide must be used in small doses, of one sixth to one fourth fluid ounces each, injected into holes ten to sixteen inches deep,* which must be instantly closed on the removal of the "injector."† Of these holes there must be at least three per square yard of vineyard surface, regularly and evenly distributed; say ten to twelve thousand holes per acre. As an approximate measure of the speed and cost of such proceeding, it is stated that two ordinary laborers, working together, finish off about three hundred holes per hour.

IV. When the "death treatment" is intended, the number of holes, or the dose of the insecticide, or both, are to be increased in a ratio that varies with the nature of the soil. Say, for example, fifteen thousand holes per acre, and in each fifty per cent more of the liquid.

V. In beginning the treatment of a badly infested vineyard, it is advisable to repeat the injections after the lapse of ten or fifteen days. When this is intended, smaller doses than the above may be used, and the second set of holes should be intermediate between the first.

The cost of one "culture" treatment in France is given at eighty-seven and one half francs, or about seventeen dollars and fifty cents, per acre; that of two treatments, with diminished dose of the liquid, at one hundred and twenty-five francs, or say twenty-five dollars. This is on the basis of sixty cents daily for each laborer, and four and one half cents a pound for the bisulphide, wholesale—from two hundred and fifty to two hundred and eighty pounds per acre being used.

From these data it will be easy to determine approximately, beforehand, the cost of treatment with bisulphide, under the prices for labor and material prevailing in this country.

VI. The insecticide treatment of infested vines should always be accompanied by the use of appropriate manures, in order to strengthen the vitality of the vine and thus increase its resistance, both to the Phylloxera and to the influence of the insecticide. The nature of the manures required is indicated by the chemical analysis of the juices of the healthy and diseased vines. It has thus been shown that the change caused by the attack of the Phylloxera consists mainly in the diminution of the potash and albumen normally contained in the juice; also in that, instead of crystallizable sugar, the abnormal juice contains chiefly or wholly the variety called glucose.

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*The depth of the holes should be increased in proportion to the perviousness of the soil, which increases loss by surface evaporation.

†This injector consists of a hollow iron handspike, pointed, with cross-handle and foot-rest, for effective use. To this is attached a reservoir, containing about a quart of the bisulphide, closed at base by an adjustable piston-gauge valve, by whose action a dose of the liquid is ejected from an opening near the point of the spike, when the latter is withdrawn from the hole. The tool for closing the latter is a solid iron handspike with a hollow cone or cup at the lower end.

It was thus indicated that manures rich in potash and nitrogen, should be used, in order to enable the plant to maintain as nearly as possible the normal condition. Experience has abundantly justified this important conclusion. In numerous cases (probably in soils poor in potash and nitrogen, or from their sandiness not very favorable to the Vine Louse) the use of these manures alone has so far improved the condition of the vines, as to neutralize the injury done by the insect, and restore them to their usual productiveness. In all cases, when the vines were not too far gone, their condition has been materially improved by the application.

Potassic manures appear to exert the most decided effects; and fortunately, the material which most cheaply supplies this important substance (*Kainite*) can now be readily obtained in commerce. Wood ashes, wherever obtainable, are of course equally well adapted to the purpose.

On strong clay or adobe soils a dressing of quicklime will produce, for the time being, an effect similar to that of the direct application of potash manures, while at the same time it will facilitate tillage, and impart to the soil the qualities of those on which the best of wild vines are usually found.

Next in efficacy to potassic manures are those supplying nitrogen, especially in the form of ammonia. In selecting these it should be borne in mind that most of the compound ammoniacal manures of commerce contain this substance in connection with phosphates. These, however, in general, are of subordinate interest in the case before us, as proven by experiment as well as analysis. It is obviously best to throw whatever outlay can be afforded in the direction where it will do the most immediate good, by supplying the ingredients chiefly needed. The commercial sulphate of ammonia, now abundantly and cheaply obtained from gas-water, seems to be one of the most available materials for the purpose. All refuse animal matter answers the same object; and so, to a considerable extent, does Chilian saltpeter.

As a matter of course, stable manure answers this, as it does almost every other purpose for which manure is wanted. The only question is, how to get enough of it—the problem which agriculturists have been trying to solve from the most ancient times to the present.

Since everything that tends to strengthen the vitality and development of the vine, increases its power of resisting the attacks of the enemy, and correspondingly increases its ability to produce crops despite of the drain upon its juices, thorough and careful culture at the proper time is to be considered as one of the necessary elements of success in the struggle. This point is not made very prominent by the French Commission, because French cultivators are habitually diligent in this respect. But as this is far from being the rule on this side of the Atlantic, an express admonition can hardly be deemed superfluous. Thorough tillage is cheaper than manuring, when the manure has to be bought; and on our unexhausted soils it will to a large extent replace the latter. That deep tillage is especially important in California, on account of the long dry season, hardly requires discussion.

The question as to whether it will *now* pay to manure and cultivate the vineyards thoroughly, I will not discuss at length. The present state of our viniculture is in so many respects anomalous, that it can hardly be taken as a safe basis for estimates of what may be, even a few years hence.

In the natural course of things California can hardly fail to become one of the foremost grape-growing countries of the world, since it possesses all the natural advantages for this branch of industry that can be imagined. The agriculture of all countries must, after a short period of exhaustive culture, be carried on on the basis of returns to the soil in the shape of manures. Even our Western and Southern States are fast coming to this, and California will have to do so in her turn; first commencing with such crops as from their high value and sensitiveness as to quality, will best pay for high culture. The grape crop is preëminently one of these.

In any case, the question will soon arise, whether owners of vineyards can better afford to manure, or to lose their investment. Those who are now suffering from the ravages of the Phylloxera, will doubtless be able to throw some light on the question.

There are two other modes of applying the carbon bisulphide, that have been measurably successful in practice, and may present advantages in certain cases.

One is, to absorb the liquid bisulphide into porous bodies, such as wood or clay, which are then buried in the soil near the vines. From them, a slow diffusion of the vapor takes place, sufficient to kill the parasites, but not to injure the vine roots. The most successful application of this principle is that of the "*Cubes Rohart*" or Phylloxera bricks; prisms of half-baked, porous clay, filled with the liquid insecticide under pressure, and then coated with glue to prevent evaporation, until the glue is softened by the moisture of the soil. The operation of introducing these Rohart bricks into the soil, being the same as in the case of the liquid bisulphide, it is obvious that the entire expense of their manufacture is in excess of the cost of the use of the liquid insecticide; the only advantage being that in no case can the vine roots be injured by the very slow evolution of the poisonous vapor. But, since experience has shown that the same result can be achieved by an adequate subdivision of the liquid doses, there is little probability that any such indirect mode of application will hereafter be preferred.

The sulpho-carbonate of potassium has already been mentioned as one of the forms in which bisulphide of carbon may be applied. It being rendered soluble in water by combining it with sulphide of potassium (liver of sulphur.) The preparation of this compound is somewhat complex, though not very costly. It ranks next to the carbon bisulphide as a cheap and effective insecticide, but it is not quite as harmless to the vine roots, and its application, by means of water, is more laborious and costly. But, there are cases in which it is nevertheless preferable. It sometimes happens that in very pervious soils, in which the bi-sulphide must be injected to a considerable depth, the insects clinging to the most superficial roots are not killed, in consequence of too ready access of air, by which the poisonous vapor is so diluted as to be ineffectual. In such cases, water charged with about one eight-thousandth of its weight of the sulpho-carbonate, is an effectual and comparatively cheap surface application, the soil being moistened with it to a depth of six to ten inches only. It is therefore very desirable that this compound, also, should be accessible to vine-growers.

Other Insecticides.

Of other insecticide applications that may be available and useful in certain cases, it will suffice to mention a few that have proved to be of some practical utility.

Coal tar and *crude carbolic acid* have from the first been prominent among the antidotes suggested; and while they have failed to perform all that might be desired, there can be no doubt that they may advantageously be used as repressive agents, to impede or prevent the migration of the wingless insect over the surface of the ground, as well as the flight of the winged form. These objects are, to a considerable extent, accomplished by sprinkling the surface of the ground thickly with sawdust, or similar material, previously impregnated with tar, or tar water; the operation to be repeated from time to time, as the odor evaporates; a somewhat thicker dressing of the same material to be applied around the stock of the vine. Application of the same to the exposed surface roots does not seem to pay for the additional trouble by increased effects; and too direct contact of the tar with the rootlets injures or kills the latter.

Soot may be similarly used; its effects are advantageous in other respects, and there is no danger of injury to the vines.

Gas lime, from the purifiers, must be used with great caution. Its effects, due to the combined action of the tarry substances and of sulphur compounds (the latter giving off "sulphuretted hydrogen" in the soil) are so energetic, that the vine may easily suffer as much therefrom as the Phylloxera. It may be applied mixed in moderate quantities with the tarred sawdust, or scattered over the surface sparingly by itself.

Sulphuretted hydrogen, generated in the soil on the application of the sulphur compounds of some of the metals, etc., is a very energetic insecticide, but scarcely less dangerous to vegetation, unless its action is made very brief. It is instant death to insects, while plants recover, after some time, from the effects of a brief exposure to its action. Hence its availability for the destruction of the Phylloxera, if used with great caution. So much permanent injury, however, has resulted from the improper and excessive use of sulphides, that their application by inexperienced hands is mainly useful for the purpose of exterminating the insect in ground which is to be replanted in vines, after the removal or death of infested stocks. Where the residues of soda manufactories are available, this can be done at a cost not exceeding that of transportation and application. Otherwise, suitable materials are not ordinarily obtainable at a low cost, apart from the gas lime, already referred to.

PREVENTIVE MEASURES.

Whatever may be the conclusion reached in respect to the profitableness of maintaining or restoring badly infested vineyards, there can be no possible doubt in regard to the action to be taken in districts not yet invaded. Since the attack always proceeds from a few well defined and easily recognized centers, a close and unremitting watch must be kept over every vineyard in each region, in order to detect the invasion in its first beginnings; when a few pounds of the insecticide, coupled with a few hours of intelligent work, will at once put an end to the immediate danger of farther spreading of the pest. The transportation of vineyard products, and especially of cuttings from infested regions, should be closely guarded, and a preliminary disinfectant treatment with bisulphide vapor applied in any case of doubt. Wagons, agricultural implements, and even the clothes of persons working in infested vineyards, may carry the eggs of the insect from one vineyard to the other, or from infested portions of one and the same to the sound portion.

It is thus obvious that sanitary regulations similar to those practiced in respect to other contagious diseases, should be established and enforced in regard to the Phylloxera pest. No one should be allowed to disregard or consider himself exempt from such regulations, and their infringement should be visited with the same reprobation or penalty that would attach to the violation of the sanitary rules regarding smallpox or yellow fever. Above all is it needful that no one should be permitted to hide the fact that his premises are infested, since the precautions adopted for the common welfare would thus be rendered nugatory. Any sale or pecuniary transaction based upon a wilful concealment of such fact, would be morally, and should be legally, considered as tainted with fraud.

It is now known that the infested region forms a broad belt across the State, from Sonoma to the Sierras, the northern limit being from the head of the Sonoma Valley proper, below Bennett Valley, across to Yountville, in the Napa Valley, and thence to the neighborhood of Placerville; while the southern limit seems to be, thus far, the north shore of the bay, the Sacramento and American Rivers, American River in the valley; in the foothills, south of the same. But one infested spot is known north of Yountville, and this there is reason to hope will be promptly stamped out. It is for those living outside of the above limits to see that the enemy is not carried into their vineyards, either by carelessness or intentionally, and with the aid of the measures suggested above this can unquestionably be done.

"Eternal vigilance" will be found in this case, as in others, the cheapest price at which exemption from the pest can be purchased. Any vine showing symptoms of disease should be at once examined, especially on its outlying white rootlets, in order to detect the swellings that form the mark most readily recognized by the naked eye. Upon these, also, the minute yellow insects are most easily seen. An infested spot will soon appear as a basin-shaped depression in the generally leafy surface of the vineyard. Of course, such spots may result from other causes, such as poor or shallow soil, lack of drainage, etc. In their examination for the presence of the Phylloxera, not only the vines within the depression should be examined, but also those located two or three rows beyond, since, as already stated, the insect prefers strong and healthy vines for pasture, and will entirely abandon weak ones long before they die.

Any good eye can detect the characteristic marks of the Phylloxera, when once accustomed to the search; but by the aid of the lens, and a comparison with the figures given above, little doubt can be left in most cases. In case of doubt, specimens sent to the University will be examined and reported upon. But in their transmission great care should be taken to prevent an accidental scattering of the contents of the package. A few rootlets, or root fragments, should be inclosed in a small vial, filled with moist earth; this, well stoppered and then inclosed in a bored wooden block, forms a safe package, which can be sent by mail at a trifling expense.

OUR FUTURE VINEYARDS.

However important it may be to save the vineyards now existing, the problem of rendering those to be planted hereafter, proof against the attacks of the Phylloxera, deserves no less serious consideration. Fortunately, the thorough studies made in the East and in Europe on this subject, show us a plain and inexpensive way to the attainment of this great desideratum.

The fact that the Root Louse does not attack the roots of certain grape varieties, while the Gall Louse is equally unable to live on the leaves of others, at once suggests the grafting of the latter varieties upon the former as an effectual remedy against the depredations of either form of the Phylloxera.

The practical application of this principle has already been widely tested, both in the East and in Europe; and in most cases with the happiest results.

Cases of failure have also been reported, and these appear to be reducible to two classes. The first and most numerous is that which is referable to the inattention of observers to the necessary precaution of preventing the scion from *casting roots of its own*, by grafting sufficiently above ground, instead of on the root, as is the usual practice in grafting grapevines.

A second but less numerous class of failures seems to have resulted from actual differences in the kind and degree of susceptibilities of the varieties used, from that experienced in other localities. At first sight this appears an alarming result; but it loses much of its seriousness when we reflect how strongly the nature of the soil, as well as the accidental character of a season, may have influenced both the original determination of the character of the vine in relation to the Phylloxera, and the subsequent contradictory experiments. It is contrary to all experience to suppose that the vine, in its relations to the Phylloxera, should act differently from what it—as well as all other grafted stocks and scions—is known to do as regards every other peculiarity. The facts before us, however, are sufficient to warn us that before determining upon the proper stocks and scions for our vineyards, somewhat extensive and prolonged experiments should be made; and that not only at one locality in the State—least of all at one where, as is the case at Berkeley, the grape does not succeed under ordinary circumstances—but in each of the chief vine-growing districts of the State. In the meantime, only such stocks as have proved to resist the Phylloxera most completely, under all circumstances, should be chosen as the basis of new vineyards.

The following table, taken from Professor Riley's reports, exhibits the result of experience in the Eastern States concerning the relative powers of resistance of the most important grape varieties, to the Root Louse. The relative "importance" indicated in the table, refers, of course, to the general estimate of the wine-making qualities and hardiness of the varieties, in the climate and soils of the Western States—especially Missouri, Illinois, and Ohio. For California these estimates may require modifications, which must be determined by experience.

TABLE OF GRAPE VARIETIES.

EXHIBITING THEIR RESISTANCE TO THE PHYLLOXERA.

A.—Recommended for use as stock to graft on, because not liable to the Root Louse.

1. Concord,
2. Clinton,
3. Herbemont,
4. Cunningham,
5. Norton's Virginia,
6. Rentz,
7. Cynthiana,
8. Taylor.

B.—Varieties to graft on the above—very liable to the Root Louse.

Of First Importance:

1. Catawba,
2. Iona,
3. Delaware,
4. Wilder,
5. Goethe,
6. All European Grapes (including Mission).

Of Secondary Importance:

7. Ives,
8. Maxatawney,
9. Hartford Prolific.

Fortunately, the two varieties most highly esteemed in the Mississippi Valley for their wine-making qualities and hardiness, are also first among those enjoying immunity from the Root Louse. It might thus fairly become a question, whether some of these American varieties should not bodily be substituted, to some extent, to the varieties of the European stock, now almost exclusively cultivated in California. But there can hardly be a question as to the propriety—not to say necessity—of using these hardy varieties as stocks whereon to graft the more delicate ones we may wish to retain on our list. That the Concord and Clinton, as well as the Catawba, Isabella, and other American varieties, make a vigorous growth in California, experience has already demonstrated, perhaps at the cost of introducing the Phylloxera into the vineyards of this coast. We may as well now try to profit by the experience so dearly bought; the more as the Mission grape is not, assuredly, in itself a desirable wine grape.

Among the resistant stocks most readily available to California grape growers, the native wild grape, *Vitis Californica,* deserves earnest attention. In its botanical characters it stands near the wild species from which the Clinton and Taylor are derived; and while it does not seem to harbor naturally either variety of the Phylloxera, experiments made by planting it among infested vines, seem to show that, although some insects will migrate and attach themselves to its roots, it does not suffer in any sensible degree from this attack. It should be understood that under similar circumstances the roots of the Clinton and Taylor are also visited by the insect, but without injuring vitality. Experiments as to the facility of propagation, adaptability to grafting with the most desirable varieties of the European stock, etc., are now in progress, both at the experimental grounds of the University, and by private parties, so that certainty on these points will not be long delayed. Naturally, also, the Californian wild grape seems to promise well for development into a desirable claret wine grape, and experiments on all these points cannot be too widely repeated.

The expense of using grafts in planting out vineyards is, of course, somewhat greater than when simply rooted cuttings are set out. But this is a trifling consideration when an investment which is to last for thirty or forty years is at stake. Grafting the vine above ground is not by any means so precarious an operation as is supposed by many, and may be accomplished successfully in a variety of ways, the most important of which are: 1. Grafting the rooted cuttings; when carefully done, especially using canes of the same diameter, in good seasons but a small percentage fails. 2. Grafting by inarching; this is applicable to older vines, and is done by inserting both ends of the scion, sharpened, into cuts made in the stock so as to cause the former to be elastically retained. The scion so placed rarely fails to "take," and the stock and scion can be severed at leisure between the joints. 3. Another mode, strongly recommended in the West, is to plant two cuttings (stock and scion) about a foot apart, and as soon as the canes of the first year's growth have sufficiently ripened, join together firmly by smooth-cut surfaces, and after they have united, cut the connection between the scion and its root. This mode is of course infallible, as it can be repeated should the first joint fail to "take."

Either mode of proceeding, of course, to be successful requires precautions which I cannot here consider at length. One essential point, however, is that cleft grafting is ill adapted to American canes at least, and probably to all.

FACILITY OF PROPAGATION.

An important point to be considered in this connection is the facility with which the several stocks and scions recommended may be propagated in the cheapest manner, *i. e.*, by rooting cuttings; it being obvious that propagation, by layering, if necessary, would materially increase the first cost of a vineyard. On this subject the subjoined table (furnished by Mr. George Husman, the veteran Missouri viniculturist, to Professor Riley), will convey important information:

TABLE OF GRAPE VARIETIES.

EXHIBITING FACILITY OF PROPAGATION BY CUTTINGS.

A. Practically not propagable by Cuttings; must be Layered.

1. Herman,
2. Norton's Virginia,
3. Cynthiana.

B. Quite difficult to propagate from Cuttings.

4. Herbemont,
5. Cunningham,
6. Devereux,
7. Rulander,
8. Louisiana,
9. Delaware.

C. Cuttings root with tolerable ease.

10. Eumelan,
11. Creveling,
12. Maxatawney.

D. Cuttings root easily.

13. Hartford Prolific,
14. Telegraph,
15. Ives,
16. Concord,
17. Catawba,
18. Iona,
19. Diana,
20. Rogers' Hybrids (Goethe, Massasoit, Wilder, Lindley, Agawam, Merrimac, Salem, etc.),
21. Arnold's Hybrids (between Foreign and Clinton.)

E. "Root like Willows."

22. Clinton,
23. Taylor.

It will be observed that here, again, the Clinton and Concord stand among those offering the greatest advantages; the former, with the Taylor, preëminently so. It would thus seem that, so far as experience goes, these two varieties offer the best prospects for the solution of the important problem before us.

Of late the propagation of vines by means of seed has been considerably discussed and experimented upon. It has been contended by some that the attack of the Phylloxera is due, not to its introduction from America, but to a gradual weakening of the vitality of the vine by long continued cultivation, and especially propagation by cuttings only.

While the array of facts carefully observed and compared, seems conclusive against this view (which is most especially inapplicable to the American grape varieties but lately taken from the woods, and yet quite as sensitive to the attack of the insect as any of the European varieties), yet it is indisputable that vines grown from cuttings offer points of weakness not present in a normally grown seedling. The root system of the latter is more copious, more widely and deeply spread, and its crown does not offer a point of weakness and a favorable locality for a nidus of the attacking insect, such as is presented by the old cane surfaces between the several joints from which the roots have sprung in the cutting. It is even contended by some that the seedlings "come true" to the parent variety, to a very great extent. While the latter claim may be very gravely called in question, as contrary to all past experience, it may well be worth the while of the grape grower to give to his vines the additional vigor and security afforded by their being seedlings instead of rooted cuttings, when intended as stocks for grafting. In other countries this practice is considered as involving a year's delay in the bearing of the vine. But at least as regards the wonderfully rapid-growing native wild vine of California, this may well be called in question. Seedlings grown from seed furnished by C. A. Wetmore, Esq., of San Francisco, who has given this subject very particular attention, to the University, have this season, eighteen hundred and eighty, between March and November, reached a height of twenty inches, and a thickness of as much as one half inch at the point above the root-crown where they will be grafted, next season, with scions of all the grape varieties most desirable for culture in California. But whether propagation by seed or cuttings shall prove the more desirable method, the *Vitis Californica* promises at this time a most satisfactory solution of the question of resistant stocks for the Vineyards of the Future.

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UNIVERSITY OF CALIFORNIA.

LIBRARY BULLETIN, No. 1.

SUPPLEMENT TO THE REPORT

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1ⁿ

PREFATORY NOTE.

In order to facilitate reference by teacher and student to the literary and scientific current periodical literature in the University and other leading libraries of the State, the within list has been compiled by the Librarian of the University, and is respectfully submitted to the Board of Regents for publication.

J. C. ROWELL,
Librarian.

Berkeley, November 1, 1880.

LIST OF PERIODICAL LITERATURE

PRESERVED IN THE FOLLOWING LIBRARIES:

San Francisco. Academy of Sciences	A.
San Francisco. Law Library	L.
San Francisco. Mechanics' Institute	I.
San Francisco. Mercantile Library	M.
San Francisco. Odd Fellows'	F.
San Francisco. St. Ignatius College	S
Sacramento. California State Library	O.
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Oakland. Free Library	C.

June, 1880.

This list includes reviews, magazines, newspapers, and the publications of learned and other societies.

Titles are given under the first word not an article or preposition. Newspapers and the publications of societies are entered under the name of the place where they are printed.

A starred letter indicates a partial set, or the discontinuance of the periodical in question.

UNIVERSITY OF CALIFORNIA.

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Academy. London	I., M.
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Albany Law Journal. Albany, New York	C., I., L.
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All the Year Round. London	F., I., M.
Alpine Weekly Chronicle	C. (1870–2.)
American Academy of Arts and Sciences: Memoirs. Boston	U. (n. s. v. 1.)
American Academy of Arts and Sciences: Proceedings. Boston	A., C.
American Agriculturist. New York	I., M., U.
American Annual Register. New York	M.
American Antiquarian. Cleveland, Ohio	M.
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American Antiquarian Society: Transactions. Worcester	C., U. (v. 1–2.)
American Architect and Building News. Boston	C., I., M.
American Art Review. Boston	F., I.
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American Association for the Advancement of Science: Proceedings. Salem	C., U.
American Bee Journal. Chicago	I.
American Bible Society: Annual Reports. New York	U.*
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American Catholic Quarterly Review. Philadelphia	I., S.
American Chemical Journal. Baltimore	U.
American Chemical Society: Journal. New York	U.
American Chemist. New York	M.
American Education Society: Quarterly Register. Andover	U. (v. 1–11.)
American Ethnological Society: Transactions. New York	U. (v. 1–2.)
American Gaslight Journal: New York	I.
American Gynecological Society: Transactions. New York	C.
American Home Missionary Society: Reports. New York	U.*
American Insolvency Reports. New York	L.
American Institute of Mining Engineers: Transactions. Easton	U.
American Journal of Education. Hartford, Conn.	C., M.
American Journal of Education. St. Louis	U.*

American Journal of Horticulture. Boston	M.
American Journal of Insanity. New York	C.
American Journal of Mathematics. Baltimore	C., I., U.
American Journal of Numismatics. Boston	M.
American Journal of Philology. Baltimore	U.
American Journal of Science and Arts. New Haven	F., A., C., I., O., M., U.
American Journal of the Medical Sciences. Philadelphia	C., U.*
American Jurist and Law Magazine. Boston	C. (1829–43)., U.*
American Law Journal. Philadelphia	C. (1803–17.)
American Law Magazine. Philadelphia	C. (1843–6.)
American Law Record. Cincinnati, O.	L.
American Law Register. Philadelphia	C., L.
American Law Review. Boston	C., L.
American Law Times. Washington	C. (1868–9.)
American Machinist. New York	I.
American Medical Association: Transactions. Philadelphia	C.
American Metric Bureau Bulletin. Boston	M.
American Monthly Microscopical Journal. New York	U.
American Naturalist. Philadelphia	F., A., C., I., O., U.
American Necrological Society: Transactions. New York	C.
American Oriental Society: Journal. New Haven	U.
American Pharmaceutical Association: Proceedings. Philadelphia	C.
American Philological Association: Transactions. Hartford	U.
American Philosophical Society: Proceedings. Philadelphia	U.
American Public Health Association: Reports and papers. New York	C.
American Publishers' Circular. Philadelphia	C., U. (1863–4.)
American Quarterly Microscopical Journal. New York, 1879	F., U.
American Quarterly Review. Philadelphia, 1827–37	C.
American Railroad Journal. New York	I.
American Social Science Association: Journal. Boston	C., U.
American Society of Civil Engineers: Minutes and Proceedings. New York	C.
American Society of Civil Engineers: Transactions. New York	I., C.
American Tract Society: Annual Reports. New York	U*.
Amsterdam. Kon. Akademie van Wetenschappen: Jaarboek	A.
Amsterdam. Kon. Akademie van Wetenschappen: Verhandelingen	A.
Analyst. Des Moines, Iowa	I.
Ann Arbor Scientific Association: Proceedings	U. (1875–6.)
Annalen der Chemie und Pharmacie: (Liebig). Leipzig	U.
Annalen der Physik und Chemie: (Poggendorff). Leipzig	I., U.
Annalen der Physik und Chemie: Beiblaetter. Leipzig	I., U.
Annales de Chimie et de Physique. Paris	I., U.
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Annales des Mines. Paris	M., U.
Annales des Ponts et Chaussées. Paris	I., U.
Annales des Sciences Naturelles: Botanique. Paris	U.
Annales des Sciences Naturelles: Zoologie et Paléontologie. Paris	U.
Annals and Magazine of Natural History. London	F., M., U.
Annals of the Astronomical Observatory of Harvard College. Cambridge	A., U.
Annals of the Propagation of the Faith. Dublin	S.

Annuaire des Deux Mondes. Paris	U. (1850–67.)
Annual Cyclopædia. *See* Appleton's Annual Cyclopædia.	
Annual of Scientific Discovery (Wells). Boston	C.
Annual Record of Science and Industry (Baird.) New York	C., L., U.
Annual Register. London	C., L.
Anthropological Institute: Journal. London	F.
Anti-Jacobin Review and Magazine. London	C. (1798–1805.)
Antiquary. London	M.
Appleton's Annual Cyclopædia. New York	C., U.
Appleton's Journal. New York	F., C., I., O., M.
Archæologia Americana. Worcester, Cambridge, etc	A., C., U. (v. 1–2.)
Archæological Journal. London	C.
Architect. London	M.
Architectural Magazine and Journal (Loudon). London	C. (1834–8.)
Archiv für Anthropologie. Braunschweig	U.*
Archiv für das Studium der Neueren Sprachen. Braunschweig	U.
Archives des Sciences Physiques et Naturelles. Genève	U.
Archives of Ophthalmology and Otology. New York	C.
Arizona Miner	C. (1868.) M. (1864.)
Art Journal. London	F., C., I., M. U.*
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Art. Pictorial and Industrial. London	M.
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Art Revue Hebdomadaire Illustrée	I.
Art Union. Monthly Journal of the Fine Arts. London	C. (1839–48.)
Arundel Society: Publications. London	M.
Asiatic Journal and Monthly Register. Calcutta	C. (1816–39.)
Asiatick Researches, or Transactions of the Society Instituted in Bengal for Inquiring into the History of Asia. London	C.
Association of Municipal and Sanitary Engineers: Proceedings. London	C.
Astronomical Register. London	A.
Athenæum. London	F., C., I., M., U.
Atlantic Monthly. Boston	F., C., I., O., M., U.
Auburn. Placer Herald	C. (1852–.)
Auburn. Placer Press	C. (1857–8.)
Auckland Institute: Reports	A.
Australia. *See* Auckland, Melbourne, Sydney, Wellington.	
Baltimore. Peabody Institute: Proceedings	A.
Bankers' Magazine. London	M.
Bankers' Magazine. New York	O., M.
Batavia (Java). Bataviaasch Genootschap van Kunsten en Wetenschappen: Notulen	A.
Batavia (Java). Bataviaasch Genootschap van Kunsten en Wetenschappen: Verhandelingen	A.
Belgravia. London	F., M.
Berg-und Huettenmaennische Zeitung. Leipzig	I., U.
Berichte der Deutschen Chemischen Gesellschaft. Berlin	U.
Berkeley. University of California: Bulletins	U.
Berkeley Advocate	U. (1877–.)
Berkeley Quarterly: A Journal of Social Science. Berkeley	U.
Berkeleyan. Berkeley, California	M., U.

Berlin. Deutsche Chemische Gesellschaft: Berichte	U.
Berlin. Deutsche Geologische Gesellschaft: Zeitschrift	U.
Berlin. Gesellschaft für Erdkunde: Zeitschrift	U.
Berlin. Kön. Preussische Akademie der Wissenschaften: Abhandlungen	A.
Berlin. Kön. Preussische Akademie der Wissenschaften: Monatsberichte	A.
Berlin. Verein Deutscher Ingenieure: Wochenschrift	U.
Berlin. Verein Deutscher Ingenieure: Zeitschrift	U.
Besom. Berkeley	U.
Biblical Repository. Andover	U. (v. 1–3.)
Bibliotheca Historico-Naturalis. Göttingen	U.
Bibliotheca Sacra. Andover	M.
Blackwood's Edinburgh Magazine	F., C., I., O., L., M., U.
Blue and Gold. Oakland	U.
Bonn. Naturhistorischer Verein: Verhandlungen	A.
Bon Ton. Paris	M.
Bookbuyer (Scribner's). New York	M.
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Boston. American Academy of Arts and Sciences: Memoirs	U. (n. s., v. 1.)
Boston. American Academy of Arts and Sciences: Proceedings	C.
Boston. American Social Science Association: Journal	C., U.
Boston. Evening Bulletin	M. (1842–3.)
Boston. Massachusetts Historical Society: Proceedings	C., U. (1862–3.)
Boston. Massachusetts Historical Society: Publications	C.
Boston. New England Historic and Genealogical Society: Publications	M.
Boston. New England Palladium	M. (1807.)
Boston. Public Library: Bulletins	U.
Boston. Society of Natural History: Publications	A.
Boston Journal of Chemistry. Boston	I.
Boston Medical and Surgical Journal. Boston	C.
Brain. London	F.
Braithewaite's Retrospect of Practical Medicine and Surgery. New York	C., I., M.
Breviate of Records. San Francisco	L.
British and Foreign Medico-Chirurgical Review. London	C.
British Association for the Advancement of Science: Proceedings. London	M.
British Association for the Advancement of Science: Reports. London	F., C., I., M.
British Quarterly Review. London	F., I., O., M., U.
Bruxelles. Academie Royale des Sciences: Mémoires	A.
Bruxelles. Société Entomologique de Belgique: Annales	A.
Bruxelles. Société Malacologique de Belgique: Annales	A.
Builder. London	F., I., M., U.*
Builder and Wood Worker. New York	I.
Bulletin de la Société Chimique de Paris. Paris	I., U.
Bulletin de la Société Industrielle. Paris	I.
Bulletin of the Bussey Institution. Cambridge	U.
Bulletin of the Museum of Comparative Zoölogy. Cambridge	U.
Bulletin of the Torrey Botanical Club. New York	I.
Butte (Weekly) Record	C. (1870–.)

Calcutta. Agricultural Society of India: Journal	C.
Calcutta. Agricultural Society of India: Transactions	C.
Calcutta. Asiatic Society of Bengal: Transactions. London	C.
Calcutta. Asiatic Society of Bengal: Palæontologica India	A.
Calcutta. Geological Survey of India: Memoirs	A., C.
California Academy of Sciences: Proceedings. San Francisco	A., C., I., M., U.
California Architect and Building Review. San Francisco	F.
California Culturist. San Francisco	C. (1858–61.)
California Farmer. Sacramento	M.
California Horticulturist. San Francisco	F., A., C., I., O., M., U.
California Law Journal	C. (1862–3.)
California Legal Record. San Francisco	C.
California (magazine and) Mountaineer. San Francisco	C. (1861–3, 1868–9).
California Medical Gazette. San Francisco	C., (1868–9), M.
California Medical Journal. Oakland, 1880–	U.
Californian. San Francisco	F., C., I., O., L., M., U.
California Nautical Magazine. San Francisco	C., (1862–4), M.
California. State Medical Society: Transactions. Sacramento	M., U.
California Teacher. Sacramento	M., U. (v. 1–12.)
Cambridge. American Antiquarian Society: Proceedings	A.
Cambridge. Bussey Institution: Bulletins	U.
Cambridge. Entomological Club: Psyche	A., M.
Cambridge. Harvard Astronomical Observatory: Annals	A., U.
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Cambridge. Harvard Library: Bulletins	U.
Cambridge. Museum of Comparative Zoology: Bulletins	A., U.
Cambridge. Museum of Comparative Zoology: Illustrated Catalogue	U.
Cambridge. Museum of Comparative Zoology: Memoirs	A.
Cambridge. Museum of Comparative Zoology: Reports	U.
Cambridge. Nuttall Ornithological Club: Bulletins	A.
Cambridge. Peabody Museum of Archæology: Reports	A., U.
Camden Society: Publications. London	U.*
Canada Law Journal. Toronto	C., L.
Canadian Naturalist. Montreal	A.
Capp's Land Owner. Washington	L.
Catholic World. New York	C., I., M., S.
Cavendish Society: Publications. London	M.
Central Law Journal. St. Louis	C.
Central Ohio Scientific Association: Proceedings. Urbana	U. (v. 1.)
Chambers' Journal. Edinburgh	I., O., M., U.*
Chaucer Society: Publications. London	M., U.
Chemical News. London	C., I., M., U.
Chemical Society: Journal. London	M., U.
Chicago Academy of Sciences: Proceedings	A.
Chicago Legal News	L.
China Review. Hongkong	M.
Chinese Repository. Canton	M., U., (1834–5.)
Christiania. Videnskabs-selskabet: Forhandlinger	A.
Christian Observer. Boston	U.
Christian Spectator. New Haven	U.*
Christian's Magazine. New York	U.*
Cincinnati Society of Natural History: Journal	A.

Civil Engineer and Architects' Journal	C.,* M., U.*
Civilingenieur. Leipzig	U.
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Classical Journal. London	C. (1810–26)., M.
Clinical Society: Transactions. London	I.
Coast Review. San Francisco	F., O.
Cobden Club: Publications. London	U.
Code Reporter. New York	C. (1848–51.)
Coleccion de Documentos Ineditos. Madrid	L.
Commercial and Financial Chronicle. New York	C., I., M.
Commissioner of Patents' Journal. London	I.
Comptes Rendus des Séances de l'Academie des Sciences. Paris	M., U.
Congregational Quarterly. Boston	U. (v. 1–7.)
Congressional Record. Washington	C., L., M., S., U.
Connecticut Academy of Arts and Sciences: Transactions. New Haven	A.
Contemporary Review. London	F., C., I., M., U.
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Cornhill Magazine. London	F., C., I., O., M.
Cosmos. Paris	U. (1870.)
Country Gentleman's Magazine. London	C.
Criminal Court Sessions. London	C.
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Curtis' Botanical Magazine. London	I.

Daily Law Journal. San Francisco	C., L.
Danzig. Naturforschende Gesellschaft: Schriften	A.
Davenport Academy of Natural Sciences: Proceedings	A., U.
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Democratic Review and United States Magazine. Washington	C. (1838-9.)
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Dublin Quarterly Journal of Science. London	C. (1863.)
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Dublin University Magazine. Dublin	F., C. (1833-57), M. (1857–)

Early English Text Society: Publications. London	U.
Easton. American Institute of Mining Engineers: Transactions	U.
Eclectic Magazine. New York	F., I., O., M.

Economist. London	U.
Edinburgh. Botanical Society: Proceedings	A.
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Engineer. London	F., C., I., M., U.
Engineer of the Pacific. San Francisco	U.
Engineering. London	C., I., M.
Engineering and Mining Journal. New York	U.
Engineering Facts and Figures. (Brown) London	C.
English Catalogue of Books. London	U., (1876–.)
Epidemiological Society: Transactions. London	C.
Eureka. Northern Independent	C., (1870–72.)
Eureka. West Coast Signal	C., (1874–6.)
European Magazine. London	C., (1782–1821.)
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Farmer's Magazine. London	M.
Federal Reporter. St. Paul, Minn	L.
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Floricultural Cabinet (Harrison). London	C., M.
Florist and Garden Miscellany. London	C., (1849–56.)
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Foreign Quarterly Review. London	U.
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Fortnightly Review. London	F., C., I., O., M., U.
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Frazer's Magazine. London	F., I., M., U.*
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Fresno Weekly Expositor	C., (1870–.)
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Galaxy. New York. (Merged into the Atlantic, 1879.)	C., O., M.
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Geneva. Société de Géographie de Geneve: Bulletin et Mémoires	U. (v. 1.)
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Gentleman's Magazine. London	F., C., M.
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Godey's Lady's Book. Philadelphia	M.
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Good Words. London--------F., C*., I., M.
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Guide. San Francisco--------I.
Guy's Hospital: Reports. London--------C., I.

Hakluyt Society: Publications. London --------M.
Halle. Naturforschende Gesellschaft: Abhandlungen--------A.
Halle. Verein für Erdkunde: (Schriften)--------A.
Hall's Journal of Health. New York--------F., I., O., M.
Hansard's Parliamentary Debates. London--------L., U. (–1827.)
Hardwicke's Science Gossip. London--------I.
Harper's Monthly Magazine. New York--------F., C., I., O., L., M.
Harper's Weekly. New York--------F., M.
Hartford. American Philological Association: Transactions--------U.
Harvard College. *See* Cambridge.
Havilah Miner--------C. (1872–4.)
Healdsburg. Russian River Flag--------U. (1880–.)
Herald of Health. New York--------O.
Hermes. Berlin--------U.*
Hesperian. San Francisco--------C., M. (1858–63.)
Historical Magazine. Boston and New York--------C. (1857–61), M.
Historische Zeitschrift (Sybel). München--------U.
Historisches Taschenbuch (Raumer). Leipzig--------U. (1830–46.)
Historiska Handlingar. Stockholm--------U. (v. 1–7.)
Hogg's Instructor. Edinburgh--------M.
Honolulu. Friend --------M. (1850–4.)
Honolulu. Polynesian--------M. (1844–5.)
Hours at Home. New York--------M.
Household Words. New York --------M.
Hunt's Merchant's Magazine. *See* Merchant's Magazine (which was succeeded by the Commercial and Financial Chronicle).
Hutchings' Illlustrated California Magazine. San Francisco--------C., M., U.

Illustrated London News. London--------F., I., M.
Illustrated Sporting and Dramatic News. London--------M.
Illustrirte Welt. Stuttgart--------F.
Illustrite Zeitung. Leipzig --------F., M.
Ilustracion Española y Americana. Madrid --------M., U.
India. *See* Calcutta, Dehra Dun, Roorkee.
Industrial Monthly. New York--------M.
Institut de France. Academie des Sciences: Comptes Rendus--M., U.
Institut de France. Academie des Sciences: Mémoires--------U.
Institut de France. Academie des Sciences Morales et Politiques: Comptes Rendus--------U.
Institution of Civil Engineers: Minutes of Proceedings. London--------C., I.
Institution of Naval Architects: Transactions. London--------I.
Insurance Law Journal. New York --------L.
Intellectual Observer. London--------M.
International Review. New York --------F., C., I., O., M., U.
Inyo Independent--------C. (1870.)
Iowa Hill. News --------C. (1857).

Iowa Hill. Weekly Patriot	C. (1859–60.)
Iron. London	I., M.
Iron Age. New York	I.
Jackson. Amador Dispatch	C. (1870–.)
Jahrbuch (Neues) für Mineralogie, etc. (Leonhard, etc.) Stuttgart	A., U.
Jahrbücher für Classische Philologie. Leipzig	U.
Jahrbücher (Neue) für Philologie und Pædagogik. Leipzig	U.
Jahresbericht der Chemie. Giessen	U.
Jahresbericht der Chemischen Technologie (Wagner). Leipzig	U.
Jahresbericht der Reinen Chemie (Staedel). Tübingen	U.
Jahresbericht über die Fortschritte der Agricultur-Chemie. Berlin	U.
Jahresbericht über die Fortschritte der Chemie (Berzelius). Tübingen	U.
Journal de Conchyliologie. Paris	A., U.*
Journal für Praktische Chemie. Leipzig	U.
Journal of Forestry. London	F.
Journal of Gas-lighting. London	I.
Journal of Jurisprudence. Edinburgh	L.
Journal of Literature and Popular Progress (Howitt). London	C. (1847–9.)
Journal of Mental Science (Bucknill). London	C.
Journal of Microscopic Science. London	C.
Journal of Philology. London	U.
Journal of Physiology. London	U.
Journal of Science. London	I.
Journal of Social Science. Boston	C., U.
Journal of Speculative Philosophy. St. Louis	F., M., U.
Journal of the Agricultural Society of India. Calcutta	C.
Journal of the American Chemical Society. New York	U.
Journal of the American Oriental Society. New Haven	U.
Journal of the Anthropological Institute. London	F.
Journal of the Chemical Society. London	M., I., U.
Journal of the Franklin Institute. Philadelphia	F*, I., M., U.
Journal of the Horticultural Society of England. London	C.
Journal of the Iron and Steel Institute. London	C.
Journal of the Linnæan Society. London	I.
Journal of the Military Service Institution of the United States. New York	I.
Journal of the Quekett Microscopic Club. London	C.
Journal of the Royal Agricultural Society. London	C., I.
Journal of the Royal Geographical Society. London	C.
Journal of the Royal United Service Institution. London	C., I., L.
Journal of the Society of Arts and of the Institutions in Union. London	C.
Journal of the Society of Telegraph Engineers. London	C.
Journal of the Statistical Society. London	F., I.
Jurist. London	C.
Kern County Gazette	C.
Kladderadatsch. Berlin	I.
Klamath. Northern Record	C. (1870–2.)
Knickerbocker. New York	M.

Königsberg. Physikalisch—Œkonomische Gesellschaft: Schriften	A.
Kritische Zeitschrift für Rechtswissenschaft. Heidelberg	U.*
Lady's Companion. New York	M.
Lakeside Monthly. Chicago	M.
Land and Water. London	I.
Landwirthschaftlichen Versuchs—Stationers. Berlin	U.
Law Journal Reports. London	C. (1832–.)
Law Reporter. Boston	C. (1847–50.)
Law Times. London	C. (1843–.)
League, The. [Anti-corn laws.] London	U. (1843–5.)
Legal Intelligencer. Philadelphia	L.
Legal News. Montreal	L.
Legal Observer. London	C. (1830–56.)
Leisure Hour. London	F., M.
Lens. Chicago	M.
Leslie's Illustrated Weekly. New York	F.
Leslie's Lady's Magazine. New York	M.
Leslie's Sunday Magazine. New York	I.
Leyden. Sternwarte: Annalen	A.
Librarian	F.
Library Journal. New York	F., C., I., L., M., U.
Library Table. New York	M.
Liebig's Annalen der Chemie. Leipzig	U.
Linnæan Society: Journal. London	I.
Linnæan Society: Proceedings. London	A.
Linnæan Society: Transactions. London	I., M.
Lippincott's Magazine. Philadelphia	F., C., I., O., M.
Literarisches Centralblatt. Leipzig	U. (1879–.)
Literary Gazette. London	C. (1817–51.)
Literary Panorama. London	C. (1807–14.)
Literary World. Boston	M.
Littell's Living Age. Boston	F., I., O., M.
Littell's Museum. Boston	M.
Livingston's Law Magazine. New York	C. (1850–1.)
Livingston's Law Register and Business Guide. New York	C. (1851–4.)
Livingston's Monthly Law Magazine. New York	C. (1853–5.)
London. Aeronautical Society of Great Britain: Reports	M.
London. Anthropological Institute: Journal	F.
London. Arundel Society: Publications	M.
London. Association of Municipal and Sanitary Engineers: Proceedings	C.
London. British Association for the Advancement of Science: Proceedings	M.
London. British Association for the Advancement of Science: Reports	F., C., I., M.
London. Camden Society: Publications	U*.
London. Cavendish Society: Publications	M.
London. Chemical Society: Journal	I., M., U.
London. Chemical Society: Memoirs	U.
London. Clinical Society: Transactions	I.
London. Cobden Club: Publications	U.
London. Commissioner of Patents Journal	I.

London. Criminal Court Sessions	C.
London. Early English Text Society: Publications	U.
London. Epidemiological Society: Transactions	C.
London. Ethnological Society: Journal and Transactions	F.
London. Geographical Society: Journal	F.
London. Geological Society: Proceedings	A.
London. Geological Society: Quarterly Journal	F., I., U.
London. Guy's Hospital: Reports	C., I.
London. Horticultural Society of England: Journal	C.
London. Institution of Civil Engineers: Minutes of Proceedings	C., I.
London. Institution of Naval Architects: Transactions	I.
London. Iron and Steel Institute: Journal	C.
London. Linnæan Society: Journal	I.
London. Linnæan Society: Proceedings	A.
London. Linnæan Society: Transactions	I., M.
London. Medico-Chirurgical Society: Transactions	C., I.
London. National Association for the Promotion of Social Science: Transactions	C., M.
London. New Shakespeare Society: Publications	M.
London. Obstetrical Society: Transactions	C.
London. Palæontographical Society: (Monographs)	I.
London. Pathological Society: Transactions	F.
London. Philological Society: Transactions	C., M.
London. Quekett Microscopic Club: Journal	C.
London. Ray Society: Publications	U*.
London. Royal Agricultural Society: Journal	C., I.
London. Royal Geographical Society: Journal	C.
London. Royal Geographical Society: Proceedings	A., I.
London. Royal Geographical Society: Publications	M.
London. Royal Horticultural Society: Proceedings	A.
London. Royal Institute of British Architects: Papers	C.
London. Royal Society: Philosophical Transactions	C. (1665–1800), I.
London. Royal Society: Proceedings	I., U.
London. Royal United Service Institution: Journal	C., I., L.
London. St. Bartholomew's Hospital: Reports	I.
London. St. George's Hospital: Reports	I.
London. St. Thomas Hospital: Reports	I.
London. Shakespeare Society: Publications	C., U.
London. Social Science Association: Transactions	F.
London. Society of Arts: Journal and Official Record	C.
London. Society of Engineers: Transactions	C., I.
London. Society of Telegraph Engineers: Journal	C.
London. Statistical Society: Journal	F., I.
London. Sydenham (Old and New) Society: Publications	C.
London. Zoological Society: Publications	I., M.
London Catalogue of Books	C., (1831–55.)
London. Daily Times	I., M.
London, Edinburgh, and Dublin Philosophical Magazine London	M., U.
London Lancet. New York	I., M.
London. Pall Mall Budget	I.
London. Public Opinion	I.
London Quarterly Review	F., I., M., U*.

London Society. London	F., M.
Los Angeles. Daily News	C. (1870–2.)
Lower Canada Jurist. Montreal	C., L
Loyal Publication Society: Publications. New York	U

Macmillan's Magazine. London	F., I., U.*, M.
Madrid. Coleccion de Documentos Ineditos	L.
Madrid. Real Academia de Ciencias: Memorias	A.
Madrid. Real Observatorio: Anuario	A.
Magazine of American History. New York	F., I., L., M.
Magazine of Art. London	F.
Manufacturer and Builder. New York	F., I.
Mariposa Free Press	C. (1870–2.)
Martinez. Contra Costa Gazette	C. (1870–8), U. (1880–.)
Marysville Daily Standard	C. (1870–2.)
Marysville Weekly Appeal	C. (1871.)
Masonic Mirror. San Francisco	M.
Massachusetts Historical Society: Proceedings. Boston	C., U. (1862–3.)
Massachusetts Historical Society: Publications. Boston	C.
Mechanic's Magazine. London	C. (1823–57), M.
Mechanic's Register. London	M.
Medical Eclectic. New York	C.
Medical News and Abstract. Philadelphia	C.
Medical Record. New York	C.
Medical Times and Gazette. London	C. (1842–63.)
Medico-Chirurgical Review. London	C. (1870–7.)
Medico-Chirurgical Society: Transactions. London	C.
Medico-Chirurgical Transactions. London	C., I.
Medico-Literary Journal. San Francisco	M.
Melbourne. Australasian	I., M.
Melbourne. Royal Society of Victoria: Transactions (and proceedings)	A.
Mendocino Beacon	C. (1880.)
Mercantile Marine Magazine. London	M.
Merchants' Magazine. (Hunt.) New York	C., M., U*.
Messenger of Mathematics. London	U.
Messenger of the Sacred Heart. Woodstock, Md.	S.
Metallurgical Review. New York	C.
Metropolitan. New York	M.
Mexico. Ministerio de Fomento: Boletin	A.
Mexico. Museo Nacional: Anales	A., U.
Mexico. Revista Cientifica Mexicana	A.
Mexico. Sociedad Mexicana de Geografia y Estadistica: Boletin	A.
Milan. Reale Istituto Lombardo di Scienze e Lettere: Rendiconti	A.
Mind. London	U.
Mineralogische und Petrographische Mittheilungen. (Tschermak) Wien	U.
Mining and Scientific Press. San Francisco	C., I., O., M., U.
Mining Journal. London	I., M.
Modesto. Stanislaus County News	C. (1874–.)
Moniteur Scientifique. Paris	U*.
Monterey Democrat	C. (1870–2.)

Monterey Sentinel	M. (1855–6.)
Monthly and Catholic Review. London	S.
Monthly Law Reporter	C.
Monthly Magazine or British Register. London	C. (1796–1820.)
Monthly Microscopical Journal. London	I., M.
Monthly Mirror. London. (Dramatical)	C. (1795–1807.)
Monthly Review. London	C. (1770–1843.)
Montreal. Natural History Society: Canadian Naturalist	A.
Moore's Rural New Yorker. New York	M.
Moscow. Societé Impériale des Naturalistes: Mémoires	A.
München. Kön. Baierische Akademie der Wissenschaften: Abhandlungen	A.
München. Kön. Baierische Akademie der Wissenschaften: Sitzungsberichte	A.
München. Kön. Sternwarte (zu Bogenhausen): Annalen, etc.	A.
Munich. *See* München.	
Museum of Foreign Literature and Science. Philadelphia	C. (1823–39.)
Museum of the American Fauna. New York	S.
Napa County Reporter	C. (1870–.)
Nation. New York	F., C., I., L., M., U.
National Association for the Promotion of Social Science: Transactions. London	C., M.
National Bankruptcy Register. New York	C., L.
National Quarterly Review. New York	C., I., M.
Natur. Halle	M.
Nature. London	F., C., I., M., U.
Naturforscher. Berlin	U. (1874–76.)
Neolæan Review. Oakland	U.
Neue Jahrbucher fur Philologie und Paedagogik. Leipzig	U.
Nevada (California) Daily National Gazette	C. (1870–4.)
Nevada (California) Weekly Democrat	C. (1852–63.)
Newcastle-upon-Tyne. North of England Institute of Mining Engineers: Transactions	I.
New Century. New York	U. (1875.)
New England Historic and Genealogical Society: Publications. Boston	M.
New England Historical and Genealogical Register. Boston	C.
New England Journal of Education	U.
New Englander. New Haven	M., U.
New Haven. American Oriental Society: Journal	U.
New Haven. Connecticut Academy of Arts and Sciences: Transactions	A.
New Jersey Law Journal. Newark	L.
New Remedies. Quarterly Retrospect of Therapeutics, etc. New York	C.
New Shakespeare Society: Publications. London	M.
New York. American Bible Society: Reports	U*.
New York. American Chemical Society: Journal	U.
New York. American Ethnological Society: Transactions	U (v. 1–2.)
New York. American Gynecological Society: Transactions	C.
New York. American Home Missionary Society: Reports	U*.
New York. American Necrological Society: Transactions	C.

New York. American Public Health Association: Reports and Papers	C.
New York. American Society of Civil Engineers: Minutes and Proceedings	C.
New York. American Society of Civil Engineers: Transactions	I., C.
New York. Historical Society: Collections	U (n. s. v. 1.)
New York. Loyal Publication Society: Publications	U.
New York. Lyceum of Natural History (since 1876, Academy of Sciences): Annals	A.
New York. Lyceum of Natural History: Proceedings	A.
New York. Military Service Institution of the U. S.: Journal	I.
New York. Pathological Society: Transactions	C.
New York. State Museum of Natural History: Reports. Albany	A.
New York. Torrey Botanical Club: Bulletin	I.
New York. Daily Graphic	I.
New York. Daily Register	L.
New York Journal of Medicine	C.
New York Ledger. New York	F., M.
New York. Spirit of the Times	M.
New York. Times	M., U. (1851–65.)
New York. Tribune	M.
New Zealand Gazette. Wellington	M. (1868–9.)
New Zealand Institute: Reports. Auckland	A.
Nicholson's Journal of Natural Philosophy. London	M.
Niles' Weekly Register. Baltimore, etc.	C. (1816–49), M., U. (1828–45.)
Nineteenth Century. London	F., C., I., L., M., U.
North American Review. New York	F., C., I., O., L., M., U.
North British Review. Edinburgh (and New York)	C., M., U*.
North of England Institute of Mining Engineers: Transactions. Newcastle-upon-Tyne	I.
North Pacific Review. San Francisco	C., M. (1862–3.)
Northwestern Reporter. St. Paul, Minnesota	L.
Notes and Queries. London	F., I., C., M., U*.
Nürnberg. Academia Cæsarea Leopoldina-Carolina Naturæ Curiosorum: Acta	A.
Nuttall Ornithological Club: Bulletins. Cambridge	A.
Oakland. Daily Evening Tribune	O., U. (1880–.)
Oakland. Daily News	O.
Oakland. Daily Times	C. (1878), O.
Oakland. Daily Transcript (merged into the Times)	C. (1870–7), O.
Obstetrical Society: Transactions. London	C.
Oestrus. Berkeley	U.
Official Gazette of the United States Patent Office. Washington.	A., F., I., L., S., U.
Old and New. Boston	M.
Once a Week. London	I., M.
Oregon (City) Spectator	M. (1849.)
Oriental Annual. London	C.
Overland Monthly. San Francisco	C., O., M., U.
Pacific Coast Law Journal. San Francisco	C., L.
Pacific Coast Mercantile Director. San Francisco	M.
Pacific Coast Law Reporter	C.
Pacific Life. San Francisco	L.

Pacific Medical and Surgical Journal. San Francisco--A., C., I., M., U.
Pacific Monthly. San Francisco--------M.
Pacific Rural Press. San Francisco--------C., I., O., M., U.
Pacific School and Home Journal. San Francisco--------F., I., M.
Patæontographical Society: (Monographs). London--------I.
Pall Mall Budget. London--------F.
Panama Star--------M. (1849.)
Paris. Institut de France, Academie des Sciences: Comptes Rendus--------M., U.
Paris. Institut de France, Academie des Sciences: Mémoires----U.
Paris. Institut de France, Academie des Sciences Morales et Politiques: Comptes Rendus--------U.*
Paris. Sociétié Chimique: Bulletin--------U.
Paris. Sociétié des Ingénieurs Civils: Mémoires--------U.
Paris. Galignani's Messenger--------M., (1832–3.)
Patent Law Review. Washington--------L.
Patentees' Journal of Dates. London--------F.
Pathological Society. Transactions, New York--------C.
Pathological Society. Transactions, London--------F.
Peabody Academy of Science: Proceedings. Salem (Mass.)--------A.
Peabody Institute: Proceedings. Baltimore--------A.
Peabody Museum of Archæology: Reports. Cambridge--------A., U.
Penn Monthly. Philadelphia--------U.*
Pennsylvania Law Journal--------C. (1836–42.)
Penny Magazine. London--------M.
Petermann's Mittheilungen aus Perthes Geographischer Anstalt. Gotha--------U.
Peterson's Magazine. Philadelphia--------M.
Pharmaceutical Journal and Transactions. London--------C. (1841–.)
Philadelphia. Academy of Natural Sciences: Journal--------M.
Philadelphia. Academy of Natural Sciences: Proceedings----A., M.
Philadelphia. American Medical Association: Transactions--------C.
Philadelphia. American Pharmaceutical Association: Proceedings--------C.
Philadelphia. American Philosophical Society: Proceedings----U.
Philadelphia. Franklin Institute: Journal--------F.*, I., M., U.*
Philadelphia Photographer. Philadelphia--------M.
Philological Society: Transactions. London--------C., M.
Philologus. Göttingen--------U.*
Philosophical Magazine. London. (*See also* London, Nicholson, Thomson)--------M.
Philosophische Monatshefte. Berlin--------U.
Photographic Times. New York--------M.
Phrenological Journal. New York--------F., I., M.
Pioneer: California Monthly Magazine. San Francisco, 1854–5--C., M.
Placerville. Herald--------C. (1853.)
Placerville. Mountain Democrat--------C. (1870–.)
Plumber and Sanitary Engineer. New York--------I.
Polytechnisches Journal. Augsburg--------I., M., U.
Popular Science Monthly. New York-----F., C., I., O., L., M., S., U.
Popular Science Review. London--------L., M.
Portfolio. London--------I., M.
Portfolio (Collection of State Papers). London--------U. (1836.)
Portfolio (Hamerton). New York--------C.
Potter's American Monthly. Philadelphia--------M.

Practical Magazine. Boston	C., M.
Practitioner—Journal of Therapeutics, etc. New York	C.
Prag. Kön. Böhmische Gesellschaft der Wissenschaften: Abhandlungen	A.
Princeton Review. New York	M., U.
Professional Papers of the Corps of Royal Engineers. Roorkee	C.
Professional Papers on Indian Engineering (Medley). London	C.
Property Lawyer. London	C.
Psyche. Cambridge, Mass.	F., A., M.
Publishers' Trade-list Annual (Leypoldt). New York	L., U. (1876.)
Publishers' Weekly. New York	F., C., M., U.
Puck New York	M.
Puck. San Francisco	M.
Punch. London	F., C.,* I., O., M., U.*
Punch and Judy. London	M.
Putnam's Magazine. New York	U. (1868–9.)
Putnam's Monthly Magazine. New York	C., M.

Quarterly Journal of Microscopical Science. London	I.
Quarterly Journal of Pure and Applied Mathematics. London	U.
Quarterly Journal of Science. (Crookes, etc.) London	F., C.
Quarterly Journal of the Geological Society. London	I., U.
Quarterly Oriental Magazine. Calcutta	M.
Quarterly Review. London	F., C., L., M., U.
Quebec Law Reports. Quebec	L.
Quincy. Plumas National	C., (1870–2.)

Radical. Boston. (Religious)	M.
Railroad Gazette. New York	F., I., U.
Ranking's Half Yearly Abstract of the Medical Sciences. New York	C.
Ray Society: Publications. London	U*.
Recueil General des lois et Arrets. Paris	I.
Red Bluff Sentinel	C., (1870–.)
Regensburg. Historische Verein für die Oberpfalz und Regensburg: Verhandlungen	A.
Religious Magazine. Philadelphia	U., (v. 1–4.)
Reno. Nevada State Journal	C., (1870–2.)
Repertorium für Experimental-Physik. München	U.
Reporter. Boston and New York	C., L.
Republic. Washington	M.
Republic of Letters. New York	M., (1834–5.)
Retrospective Review. London	C., M.
Revista Cientifica Mexicana. Mexico	A.
Revue de Droit Français et Etranger. Paris	U*.
Revue de Géologie. Paris	U.
Revue des Deux Mondes. Paris	I., M., U.
Revue des Questions Scientifiques. Bruxelles	S.
Revue Général de l'Architecture. Paris	C., I.
Revue Historique. Paris	U.
Revue Nationale et Etrangère. Paris	U*.
Revue Philosophique. (Ribot.) Paris	U.
Revue Scientifique. Paris	U.*
Revue Universelle. Paris et Liége	U.*
Revue Universelle des Mines. Paris	M.

Rheinisches Museum für Philologie. Frankfurt ...... U.*
Rhode Island Historical Society: Collections. Providence ...... U. (v. 4.)
Richmond. Southern Historical Society: Papers ...... C.
Riga. Naturforscher-Verein: Correspondenz-blatt ...... A.
Robinson's Epitome of Literature. Philadelphia ...... M.
Romberg's Zeitschrift. Berlin ...... I.
Rome. Acta Sancta Sedis ...... S.
Rome. Annali di Statistica ...... A.
Rome. Bilanci Communali ...... A.
Rome. Gesta Romanorum Pontificum ...... S.
Rome. Reale Accademia dei Lincei: Atti ...... A., U.
Roorkee. Corps of Royal Engineers: Professional Papers ...... C.
Royal American Magazine. Boston, 1774 ...... M.
Royal, etc. *See* Dublin, Edinburgh, London, Roorkee, Melbourne, Sidney.

Sacramento. California Statesmen ...... C. (1854–5.)
Sacramento. Daily Bee ...... C. (1857–.)
Sacramento. Daily California Times ...... U. (1856–7.)
Sacramento. Daily Democrat ...... C. (1871.)
Sacramento. Daily Democratic State Journal ...... C. (1852–7.)
Sacramento. Daily Evening Leader ...... C. (1875.)
Sacramento. Daily Record-Union ...... C., I., O., M., U. (1880–.)
Sacramento. Daily State Capital Reporter ...... C. (1868–71.)
Sacramento. Daily State Democrat ...... C. (1880.)
Sacramento. Daily Sun ...... C. (1878.)
Sacramento. Daily Union ...... F. (1859–), C. 1854–), M. (1857–8, 1863–), U. (1853–75.)
Sacramento. Democratic Standard ...... C. (1859.)
Sacramento. Hesperian (Educational) ...... C. (1858.)
Sacramento. Placer Times ...... C. (1849–50), M. (1850–1.)
Sacramento. State Tribune ...... C. (1855–6.)
Sacramento. Transcript ...... M. (1850–4.)
St. Bartholomew's Hospital: Reports. London ...... I.
St. George's Hospital: Reports. London ...... I.
St. James Magazine. London ...... M.
St. Louis. Academy of Science: Transactions ...... A.
St. Nicholas. New York ...... I., O.
St. Petersburg. Académie Impériale des Sciences: Bulletins ...... A.
St. Petersburg. Académie Impériale des Sciences: Mémoires ...... A.
St. Thomas' Hospital: Reports. London ...... I.
Salem (Mass.) Essex Institute: Proceedings ...... A.
Salem (Mass.) Peabody Academy of Science: Proceedings ...... A.
San Diego Bulletin ...... C. (1870–2.)
San Francisco. California Academy of (Natural) Sciences: Proceedings ...... A., C., I., M., U.
San Francisco. California Medical Society: Transactions ...... M.
San Francisco. Mechanics' Institute: Reports of Industrial Exhibitions ...... C., I., M., U.
San Francisco. Alta California ...... F. (1852, 1856–), C. (1849–), I., M. (1851–), U. (1855, 1859–70.)
San Francisco. Argonaut ...... C., I., M.
San Francisco. Breviate of Records ...... L.
San Francisco. California Chronicle ...... C. (1856), M. (1853–8.)

San Francisco. California Daily Courier---------------M. (1850–2.)
San Francisco. California Farmer. (San Francisco and Sacramento)---------------------C. (1873–), M. (1854–8 incomplete.)
San Francisco. California Star--------------C. (1847-8.) M. (1847.)
San Francisco. Californian. (Merged into the Alta California)---C., M. (1846–8.)
San Francisco. Chronicle------------------------------C. (1877–.), I.
San Francisco. Commercial Advocate------------------U. (1877–9.)
San Francisco. Commercial Herald and Market Review------- C., M. (1867–72.)
San Francisco. Daily American Flag---------C. (1866), M. (1864–6.)
San Francisco. Daily Commercial News-------------------------I
San Francisco. Daily Evening Bulletin---F. (1855–), C. (1855–), I., O., L. (1856–), M., U. (1855–73.)
San Francisco. Daily Evening News-------------------M. (1853–4.)
San Francisco. Daily Evening Post -------------------C. (1874–), I.
San Francisco. Daily Examiner-------------F. (1870–), C. (1870–), I.
San Francisco. Daily Herald (and Republic)--C. (1852–61), U. (1850–62.)
San Francisco. Daily Law Journal ---------------------------C., L.
San Francisco. Daily Mail-------------------------------C. (1877.)
San Francisco. Daily Morning Call--------------------C. (1877–), I.
San Francisco. Daily Pacific Star-----------------------M. (1851.)
San Francisco. Daily Stock Report----------------------C. (1875–.)
San Francisco. Daily Whig ------------------------------C. (1852.)
San Francisco. Evening Journal -------------------------C. (1852.)
San Francisco. Evening Picayune, 1851–2------------------C., M., U.
San Francisco. Evening Telegram ------------------------M. (1859.)
San Francisco. Evening Tribune -------------------------C. (1866.)
San Francisco. Figaro --------------------------------- C. 1874–5.)
San Francisco. Golden Era------------------------------C. (1856.)
San Francisco. Guide (Legal) -------------------------------------L.
San Francisco. Industrial Fair Evening Gazette-----------M. (1871.)
San Francisco. Journal de Lundi ------------------------C. (1868.)
San Francisco. Journal of Commerce--------------C., I., M. (1850.)
San Francisco. Leader--M.
San Francisco. Mercantile Gazette and Prices Current-M. (1859–67.)
San Francisco. Merchant-----------------------------U. (1880–.)
San Francisco. Merchant's Exchange, Prices Current, and Shipping List --M. (1850–2.)
San Francisco. Mining and Scientific Press---------C., I., O., M., U.
San Francisco. Morning Globe----------------------------C. (1856.)
San Francisco. Morning Post -------------------C. (1858), M. (1851.)
San Francisco. New Age-------------------------------C. (1865.)
San Francisco. Oriental (Chinese)------------------------C. (1856.)
San Francisco. Pacific----------------------M. (1851–4), U. (1869.)
San Francisco. Pacific Coast Law Journal--------------------C., L.
San Francisco. Pacific Coast Wine and Liquor Herald--U. (1876–9.)
San Francisco. Pacific Home and School Journal---------F., I., M.
San Francisco. Pacific Life---------------------------------------L.
San Francisco. Pacific News-----------------C. (1851), M. (1849.)
San Francisco. Pacific Rural Press--------------C., I., O., M., U.
San Francisco. Pacific Sentinel-------------------------M. (1856–7.)
San Francisco. Pictorial Town Talk----------------------C. (1856.)
San Francisco. Pioneer---------------------------------------C. L

San Francisco. Placer Times and Transcript-C. (1853-5), M. (1853–4.)
San Francisco. Public Balance----------M. (1850–1.)
San Francisco. Public Ledger----------M. (1853-4.)
San Francisco. Real Estate Circular----------M. (1867–8.)
San Francisco. Shipping List and Prices Current----------M. (1852–3.)
San Francisco. Statistician----------C., M.
San Francisco. Sun----------C. (1853), M. (1853.)
San Francisco. Times----------C. (1866–9), M. (1857–61, 1866–9.)
San Francisco. Town Talk----------C. (1855), M. (1857.)
San Francisco. True Californian----------C., M. (1856.)
San Francisco. Weekly Stock Report----------I.
San Francisco. West----------U. (1871-2.)
San Francisco. Wide West----------C. (1856.)
Sanitary Record and Journal of Public Health. London----------C.
Sanitary Review. London----------C.
San Joaquin Valley Argus----------C. (1872–4.)
San José. Santa Clara Argus----------C. (1870–2.)
San Mateo County Gazette----------C. (1870-2.)
San Mateo County Journal----------C. (1880–.)
Santa Barbara Press----------C. (1870–.)
Santa Rosa. Sonoma Democrat----------C. (1870–.)
Saturday Magazine. London----------C. (1832–44.)
Saturday Review. London----------F., I., M., U.
Science Observer. Boston----------U.
Scientific American. New York----------F., C., I., O., S., M., U.
Scientific American: Supplement. New York----------F., I., M., U.
Scottish Jurist. Edinburgh----------C. (1829–.)
Scottish Law Reporter. Edinburgh----------C. (1864–.)
Scribner's Monthly. New York----------F., C., I., O., M., U.
Shakespeare Society: Publications. London----------C., U.
Sharpe's London Magazine. London----------M.
Shasta Courier----------C. (1870–72.)
Sixpenny Magazine. London----------M.
Smithsonian Institution: Annual Reports. Washington----------A., C., I., L., M., S., U.
Smithsonian Institution: Contributions. Washington----------A., C., I., M., U.
Smithsonian Institution: Miscellaneous Collections. Washington----------A., C., I., M., U.
Solicitor's Journal. London----------C. (1857–.)
Sonora. Union Democrat----------C. (1870–77.)
Southern California Horticulturist. Los Angeles----------O., M.
Southern Historical Society: Papers. Richmond----------C.
Southern Law Journal and Reporter. Montgomery, Ala.----------L.
Southern Law Review. St. Louis----------C., L.
Southern Literary Messenger. Richmond----------C. (1834–56), M.
Southern Review. Baltimore----------M.
Specifications and Drawings of Patents. London----------I.
Specifications and Drawings of Patents. Washington----------I.
Spectator. London----------F., I., M., U.
Statesman's Year-book (Martin). London----------C.
Statistician. San Francisco----------C., M.
Stockholm. Historiska Handlingar----------U. (v. 1–7.)
Stockholm. Kongl. (Sevenska) Vetenskaps Akademien: Handligar----------A.

Stockholm. Sveriges Geologiska Undersökning: Nágra	A.
Stockton. Daily Evening Herald	C. (1870–4.)
Stockton. Daily Evening Leader	C. (1874.)
Stockton. Daily Independent	C. (1871–.)
Struggle, The. [Anti-Corn Laws. Preston. 1844.]	U.
Stuttgart. Verein fur Vaterländische Naturkunde in Wurttemberg: Jahreshefte	A.
Suisun. Solano Democrat	C. (1870–2.)
Sunday Magazine. London	I.
Sydenham Society: Publications. London	C.
Sydney. Royal Society of New South Wales: Transactions (and Proceedings)	U.
Tablet. London	S.
Tablet. New York	S.
Technologist. New York	M.
Telegraphic Journal and Electrical Review. London	I.
Temple Bar. London	F., I., M.
Thomson's Annals of Philosophy. London	M.
Transcontinental. (Issued on Pullman palace car.)	M. (1870.)
Trieste. Società Adriatica di Scienze Naturali: Bollettino	A.
Tuolumne City News	C. (1870.)
Ueber Land und Meer. Stuttgart	F., M., U.
Ukiah. Mendocino Democrat	C. (1870–2.)
Unitá Cattolica. Turin	S.
United Service. Philadelphia	F., C., I.
United Service Magazine. London	C., M.
United States Army and Navy Journal. New York	I., M., U.
United States Literary Gazette. Boston	U. (1825–7.)
United States Magazine. New York	M.
United States Official Postal Guide. Boston	L.
United States Service Magazine. New York	C.
Univers. Paris	S.
University Echo. Oakland	U.
University Magazine. London	I., M.
University of California: Bulletins. Berkeley	U.
Unsere Zeit. Leipzig	I., U.
Upsala. Regia Societas Scientiarum: Acta	A.
Urbana. Central Ohio Scientific Association: Proceedings	U. (v. 1.)
Van Nostrand's Eclectic Engineering Magazine. New York	F., I., M., U.
Vienna. Kaiserliche Akademie der Wissenschaften: Anzeiger	A.
Vienna. Kaiserliche Akademie der Wissenschaften: Berichte	A.
Vienna. Kais.-kön—Geologische Reichsanstalt: Abhandlungen	A.
Vienna. Kais.-kön—Zoologisch-Botanischer Verein: Verhandlungen	A.
Virginia Law Journal. Richmond	L.
Visalia. Equal Rights Expositor	C. (1862–3.)
Visalia. Tulare Times	C. (1870–3.)
Washington. National Academy of Sciences: Proceedings	A.
Washington. Patent Office: Official Gazette	A., F., I., L., S., U.
Washington. Smithsonian Institution: Contributions	A., C., I., M., U.

Washington. Smithsonian Institution: Miscellaneous collections	A., C., I., M., U.
Washington. Smithsonian Institution: Reports	A., C., I., L., M., S., U.
Washington. United States Naval Observatory: American Ephemeris	A.
Washington. United States Observatory: Publications	A., C., S., U.
Washington Law Reporter. Washington	L.
Weekly Notes of Cases. Philadelphia	L.
Weekly Reporter. London	C. (1852-.)
Wellington. Colonial Museum and Laboratory: Reports	A.
Wellington. New Zealand Gazette	M. (1868-9.)
Western. St. Louis	U.*
Western Insurance Review. St. Louis	L.
Western Jurist. Des Moines, Iowa	L.
Western Lancet. San Francisco	F., U.
Western Monthly. Chicago	M.
Westminster Review. London	F., C., I., O., M., U.
Whitaker's Reference Catalogue of Current Literature. London	L., U.
Wisconsin Academy of Sciences, Arts, and Letters: Transactions	U.
Woodland. Hesperian	C.
Worcester. American Antiquarian Society: Transactions	C., U. (v. 1-2.)
Workshop. New York	F., I., M.
Württemberg. *See* Stuttgart.	
Yokohama. Deutsche Gesellschaft fur Natur und Volkerkunde Ost-Asiens: Mittheilungen	A.
Yolo Democrat	C. (1870-3.)
Yreka Weekly Union	C. (1870-2.)
Yuba City. Weekly Sutter Banner	C. (1870-2.)
Zeitschrift der Deutschen Chemischen Gesellschaft. Berlin	U.
Zeitschrift der Deutschen Geologischen Gesellschaft. Berlin	U.
Zeitschrift der Gesellschaft für Erdkunde. Berlin	U.*
Zeitschrift des Vereines Deutscher Ingenieure. Berlin	U.
Zeitschrift für Analytische Chemie. (Fresenius) Wiesbaden	U.
Zeitschrift für Crystallographie und Mineralogie. (Groth) Leipzig	U.
Zeitschrift für das Berg-Huetten-u. Salinen-Wesen. Berlin	U.
Zeitschrift für das Chemische Grosswerbe. (Lehmann) Berlin	U.
Zeitschrift für Ethnologie. Berlin	U.*
Zeitschrift für Physiologische Chemie. Strassburg	U.
Zeitschrift für Vergleichende Sprachforschung. (Kuhn) Berlin	U.
Zoological Record. London	A.
Zoological Society: Publications. London	I., M.
Zoologische Garten. Frankfurt-am-Main	A.
Zoologischer Anzeiger. Leipzig	A.

TRANSACTIONS

OF THE

CALIFORNIA

STATE AGRICULTURAL SOCIETY

DURING

The Year 1880.

SACRAMENTO:
STATE OFFICE : : : J. D. YOUNG, SUPT. STATE PRINTING.
1880.

STATE BOARD OF AGRICULTURE FOR 1880.

DIRECTORS.

C. M. CHASE	San Francisco.
JOHN BOGGS	Princeton, Colusa County.
G. W. COLBY	Nord, Butte County.
W. P. COLEMAN	Sacramento.
P. A. FINIGAN	San Francisco.
DANIEL FLINT	Sacramento.
G. W. HANCOCK	Sacramento.
CYRUS JONES	San José.
H. M. LARUE	Sacramento.
R. H. NEWTON	Woodland, Yolo County.
L. J. ROSE	San Gabriel, Los Angeles County.
L. U. SHIPPEE	Stockton.

OFFICERS OF THE BOARD.

PRESIDENT.

H. M. LARUE	Sacramento.

SECRETARY.

I. N. HOAG	Yolo County (P. O., Sacramento.)

TREASURER.

L. A. UPSON	Sacramento.

GENERAL SUPERINTENDENT OF THE PARK AND STOCK GROUNDS.

DANIEL FLINT	Sacramento.

GENERAL SUPERINTENDENT OF PAVILION.

W. P. COLEMAN	Sacramento.

STATE AGRICULTURAL SOCIETY.

AN ACT

TO PROVIDE FOR THE MANAGEMENT AND CONTROL OF THE STATE AGRICULTURAL SOCIETY BY THE STATE.

[Approved April 15th, 1880.]

The People of the State of California, represented in Senate and Assembly, do enact as follows:

Section 1. The State Agricultural Society is hereby declared to be a State institution.

Sec. 2. Within ten days after the passage of this Act, the Governor shall appoint twelve resident citizens of the State, who shall, when organized, constitute a State Board of Agriculture, who shall, except as hereinafter provided, hold office for the term of four years, and until their successors are appointed and qualified. Vacancies occurring from any cause in the Board shall be filled by appointment of the Governor for the unexpired term of the office vacated.

Sec. 3. Within ten days after their appointment, the persons so appointed shall qualify, as required by the Constitution, and shall meet at the office of the State Agricultural Society and organize by the election of one of their number as President of the Board and said Society, who shall hold said office of President for the term of one year, and until his successor is elected and qualified. The Board shall also elect a Secretary and Treasurer, not of their number, who shall each hold office at the discretion of the Board.

Sec. 4. At the same meeting the members of the Board shall, by lot or otherwise, classify themselves into four classes of three members each. The terms of office of the first class shall expire at the end of the first fiscal year; of the second class, of the second year; of the third class, of the third year: of the fourth class, at the end of the full term of four years. The fiscal year shall be from the first of February to the first of February.

Sec. 5. The State Board of Agriculture shall be charged with the exclusive management and control of the State Agricultural Society as a State institution: shall have possession and care of its property, and be intrusted with the direction of its entire business and financial affairs. They shall define the duties of the Secretary and Treasurer, fix their bonds and compensation, and shall have power to make all necessary changes in the Constitution and rules of the Society, to adapt the same to the provisions of this Act, and to the management of the Society, its meetings and exhibitions. They shall provide for an annual Fair or exhibition by the Society of all the industries and industrial products of the State, at the City of Sacramento; *provided*, that in no event shall the State be liable for any premium awarded or debt created by said Board of Agriculture.

Sec. 6. The Board shall have power to appoint all necessary Marshals and police to keep order and preserve peace at the annual Fairs of the Society; and the officers so appointed shall be vested with the same authority for the preservation of order and peace, on the grounds and in the buildings of the Society, that executive peace officers are vested with by law.

Sec. 7. Said Board shall use all suitable means to collect and disseminate all kinds of information calculated to educate and benefit the industrial classes, develop the resources, and advance the material interests of the State, and shall on or before the first day of February of each year, report to the Governor a full and detailed account of their transactions, statistics, and information gained, and also a full financial statement of all funds received and disbursed. They shall also make such suggestions and recommendations as experience and good policy may dictate for the improvement and advancement of the agricultural and kindred industries.

Sec. 8. The Superintendent of State Printing shall, each year, print and bind in cloth four thousand volumes of said transactions, and deliver the same to said Board of Agriculture for distribution and exchange. He shall also do such job printing as said Board may require to carry out the provisions of this Act.

Sec. 9. The Directors or Boards of Managers of each County and District Agricultural Society or Association, and of each County, District, or State Horticultural and Stock Breeding Association or Society, organized and acting under the laws of this State, shall report annually, on or before the first day of April, to the State Board of Agriculture, the name and Post Office address of each officer of such Society or Association; and, on or before the first day of December, shall report to said Board of Agriculture the transactions of said Society, including the premiums offered, the list of stock and articles exhibited, and the premiums paid; the amount of receipts and expenditures for the year, the new industries inaugurated, and any and all facts and statistics showing the development and extent of the industries, products, and resources of the county or district embraced within the management of such Society or Association; *provided*, that the provisions of this Act shall not apply to any Board of Commissioners or other body organized under the laws of this State, the object of which is to promote vinicultural industries, unless such Board or body shall voluntarily request the privilege of making such reports as are called for by this Act, in which case such Board or body shall enjoy equal privileges as are accorded to other institutions devoted to agriculture.

Sec. 10. To facilitate such reports, the State Board of Agriculture shall have prepared, and shall furnish such societies with necessary schedules and blanks for such reports; and such State Board shall include such reports from societies and associations, or so much thereof as they may deem advisable, in their report to the Governor.

Sec. 11. When said State Board of Agriculture shall have been organized and classified as provided herein, the Secretary of the Board shall report such organization and classification to the Governor. He shall also report any vacancy that may occur in said Board at any time.

Sec. 12. All laws and parts of laws in conflict with this Act are hereby repealed.

Sec. 13. This Act shall take effect and be in force from and after its passage.

CONSTITUTION

OF THE

CALIFORNIA STATE AGRICULTURAL SOCIETY.

[Revised and adopted by the State Board of Agriculture, May 18th, 1880.]

NAME.

SECTION 1. This Society shall be called "The California State Agricultural Society."

OBJECT.

SEC. 2. It shall be the object of this Society to encourage the cultivation of the soil, and the general development of all the agricultural resources of this State.

SEC. 3. To foster every branch of mechanical and household arts calculated to increase the happiness of home life.

SEC. 4. To extend and facilitate the various branches of mining and mining interest.

MEMBERSHIP.

SEC. 5. *Annual Members.*—Any person who shall pay into the funds of this Society the sum of five dollars, may become a member of the same; such membership to expire at the end of the current fiscal year.

SEC. 6. *Life Members.*—Any person may become a member for life by the payment of fifty dollars; or, if already a member, by the payment of forty-five dollars, or by serving a full term as a member of the State Board of Agriculture, and shall thereafter be exempt from all dues and assessments.

SEC. 7. *Honorary and Corresponding Members.*—Any person whom the Board shall propose may be elected an honorary or corresponding member, and shall enjoy, free of charge, all the privileges of the Society, except voting and holding office.

SEC. 8. *Privileges of Members.*—Any citizen of this State, being a member of this Society, shall be eligible to office, entitled to vote, and enjoy the free use of the library, under the rules of the same, and have free admission, accompanied by his wife and minor children, to all the exhibitions of the Society, and shall be permitted to compete for premiums in any or all departments.

SEC. 9. *Expulsion of Members.*—Any member who shall present for exhibition any article or animal which he is not entitled by the rules of the Society to exhibit, or who shall attempt to deceive, or be guilty of a breach of good faith toward the Society, may be expelled by a vote of two thirds of the members present at any meeting of the Board; *provided, always,* that no member shall be expelled unless written notice of the alleged offense shall have been served on him, or left at his usual place of residence at least twenty day previous to the action.

OFFICERS.

SEC. 10. The officers of this Society shall consist of twelve Directors, to be appointed by the Governor, who shall constitute a State Board of Agriculture, seven of whom shall constitute a quorum. The Board shall be charged with the exclusive management and control of the State Agricultural Society as a State institution; shall have possession and care of its property, and be intrusted with the direction of its entire business and financial affairs; shall have power to make all necessary changes in the Constitution and rules of the Society; shall provide for an annual Fair or exhibition by the Society of all the industries and industrial products of the State, at the City of Sacramento, and such other exhibition as they may deem important. They shall elect one of their members as President of the Board and Society, and a Treasurer and Secretary, not members of the Board. They may also appoint, annually, as officers of the Board, a chemist, a botanist, a meteorologist, a geologist, a metallurgist, an ornithologist, and an entomologist, and define the duties of each. They may appoint such committees on the various departments of agriculture, mining, and manufactures, either generally, or for specific purposes, as they may deem important for the best interests of the State, and require such committees to report the results of their investigations to the Board at such times as may be named by them.

Sec. 11. *Duties of President.*—The President shall preside at all meetings of the Board, and of the Society: shall have power to call special meetings of the Board, when necessary, and at the written request of ten members may call extra meetings of the Society; shall appoint all meetings not otherwise provided for; and shall sign all financial and official documents emanating from the Society, and not otherwise provided for. In the absence of the President from any meeting of the Board or Society, any Director may be called to the chair, and during such meeting, and for the completion of any business transacted, or ordered at the same, shall have the same powers as the President.

Sec. 12. *Duties of Secretary.*—The Secretary shall conduct the correspondence of the Board or Society, keeping copies of all important letters written in the name or on behalf of the Board or Society, holding the same free to the inspection of any member of the Board or Society, at any regular meeting of the same. He shall also receive and file all letters addressed to the Board or Society, holding the same subject to the Board of Directors. He shall attend all meetings of the Society and the Board, keeping a full record of the proceedings of each in a book for that purpose. He shall prepare and publish all notices of meetings, shall keep a roll of all standing committees, and call the same (noticing absences) whenever desired to do so by the Chair; shall sign all certificates of honorary and corresponding and life memberships, and forward the same to those entitled to receive them. He shall keep, in a book prepared for that purpose, the name and address of every member; shall prepare and sign all gratuitous or complimentary cards or tickets of admission; shall countersign all diplomas, certificates of merit, etc., awarded by the Board, and forward the same to their respective claimants. He shall be ex officio Librarian; shall keep the seal, and all the plates, dies, engravings, etc., belonging to the Society, and shall cause to be struck therefrom such medals and impressions as may, from time to time, be required. He shall have charge of all specimens, models, plants, seeds, books, etc., and arrange, prepare, or distribute the same under the direction of the Board. He shall prepare all reports to be made by the Board to the Society, and to the State. He shall receive all moneys due or payable to the Society, and pay the same to the Treasurer, taking his receipt therefor; shall hold all bonds filed by officers of the Society for the faithful performance of their duty, and all vouchers for every class of expenditure. He shall countersign all drafts ordered by the Board, and all certificates of annual and life membership, and keep an account of the same in a book, as they are issued, and shall, in December of each year, prepare a tabular statement of the receipts and expenditures of the Board, according to the law organizing the same.

Sec. 13. *Duties of the Treasurer.*—The Treasurer shall receipt for all funds at the hands of the Secretary, and shall disburse the same only on the order of the Board, attested by the President and the Secretary. He shall also hold in trust all certificates of stock, bonds, notes, deeds, or other evidences of debt or possession belonging to the Society, and shall transfer, invest, or dispose of the same only by direction of the Board. He shall file with the Secretary a bond for the faithful performance of his duties; said bond to be approved by the Board, and shall, at the annual meeting, make to the Society a detailed report of all his transactions.

STANDING COMMITTEES.

Sec. 14. *Committee of Finance.*—The Committee of Finance shall consist of five members of the Board, the President being one, whose duty it shall be to audit the Secretary and Treasurer's accounts, to examine and approve all bills before they are paid, to have general supervision of the finances of the Society, and to report their transactions and financial condition of the Society in full to the Board whenever called on so to do.

Sec. 15. *Library Committee.*—The Library Committee shall consist of four members of the Board and the Secretary, whose duty it shall be to have the general supervision of the library and cabinet, to make all necessary rules and regulations for the government of the same (said rules and regulations being subject to the approval of the Board), to suggest such means for the safe-keeping and enlargement of both the library and cabinet as they may deem expedient, and to make a full report of their transactions, together with the state of the department under their charge, at each annual meeting.

Sec. 16. *Visiting Committee.*—The Visiting Committee, to be appointed by the Board from their own number, shall visit and examine all farms, orchards, vineyards, nurseries, field crops, irrigating works, agricultural machine works, agricultural machinery in operation, etc., which may be entered for competition, and which require examination at other times and places than the annual Fair; to award premiums for the same according to the schedule, and recommend such gratuities as they may deem proper, and make a full report to the Board at least one day previous to the annual Fair.

Sec. 17. *Printing and Publication Committee.*—The Committee on Printing and Publication shall consist of five (the President and Secretary being two), whose duty it shall be to contract for and superintend, under the direction of the Board, all printing and publishing necessary for the Society.

OFFICE AND ROOMS.

Sec. 18. The office, rooms, library, and cabinet of the Board and Society shall be permanently located in the Capitol of the State.

DISTRICT AGRICULTURAL ASSOCIATIONS.

AN ACT

TO FORM AGRICULTURAL DISTRICTS, TO PROVIDE FOR THE ORGANIZATION OF AGRICULTURAL ASSOCIATIONS THEREIN, AND FOR THE MANAGEMENT AND CONTROL OF THE SAME BY THE STATE.

[Approved April 15th, 1880.]

The People of the State of Califoraia, represented in Senate and Assembly, do enact as follows:

Section 1. The Counties of Alameda, Contra Costa, and San Francisco, shall constitute Agricultural District No. 1.

Sec. 2. The Counties of San Joaquin, Calaveras, Fresno, Kern, Merced, Mariposa, Stanislaus, Tulare, and Tuolumne, shall constitute Agricultural District No. 2.

Sec. 3. The Counties of Sutter, Yuba, Butte, Colusa, Tehama, Yolo, and Sacramento, shall constitute Agricultural District No. 3.

Sec. 4. The Counties of Sonoma, Marin, Solano, Napa, and Lake, shall constitute Agricultural District No. 4.

Sec. 5. The Counties of Santa Clara and San Mateo shall constitute Agricultural District No. 5.

Sec. 6. The Counties of Los Angeles, San Diego, San Bernardino, Santa Barbara, Ventura, and Inyo, shall constitute Agricultural District No. 6.

Sec. 7. The Counties of Monterey, Santa Cruz, San Luis Obispo, and San Benito, shall constitute Agricultural District No. 7.

Sec. 8. The Counties of Nevada, Placer, El Dorado, Amador, Alpine, and Mono, shall constitute Agricultural District No. 8.

Sec. 9. The Counties of Mendocino, Humboldt, and Del Norte, shall constitute Agricultural District No. 9.

Sec. 10. The Counties of Siskiyou, Trinity, and Shasta, shall constitute Agricultural District No. 10.

Sec. 11. The Counties of Plumas, Lassen, Modoc, and Sierra, shall constitute Agricultural District No. 11.

Sec. 12. Any fifty or more persons representing a majority of the counties within any one of the districts above constituted, may form an association for the improvement of the material industries within such district, and, when so formed, the association shall be known and designated by the name of —— Agricultural Association, and by such name and style shall have perpetual succession, and shall have power and authority to contract and be contracted with, to sue and be sued, to have and use a common seal, to purchase and hold and lease real estate, with such buildings and improvements as may be erected thereon, and may sell and lease and dispose of the same at pleasure. The said real estate shall be used by such association for the purposes of holding exhibitions of horses, cattle, and other stock, of the agricultural, horticultural, viticultural, mechanical, manufacturing, and domestic products of such district, with view to the improvement of all the industries in the same.

Sec. 13. The officers of such association shall consist of eight Directors, who shall constitute a District Board of Agriculture for District Number ——, a President, who shall be one of their number, and a Secretary and Treasurer, not of their number.

Sec. 14. Within ten days after the formation of an agricultural association within any of the districts above constituted, in accordance with the provisions of this Act, and notice of such formation to the Governor, the Governor shall appoint eight resident citizens of such districts as members of a District Board of Agriculture for said district, whose term of office shall be four years, except as hereinafter provided.

Sec. 15. Within ten days after their appointment, the persons so appointed shall qualify as required by the Constitution, and shall meet at a place within the district, and organize by the election of one of their number as President of the Board and association, who shall hold said office of President one year, and until his successor is elected; they shall also elect a Secretary and Treasurer.

Sec. 16. At the same meeting the members of the Board shall, by lot or otherwise, classify themselves into four classes of two members each. The terms of office of the first class shall expire at the end of the first fiscal year; of the second class, of the second fiscal year; of the third class, of the third fiscal year, and of the fourth class, at the end of the full term of four years. The fiscal year shall be from December first to December first.

SEC. 17. Each association so formed and organized is hereby declared and shall be recognized a State institution, and the Board so appointed and qualified shall have the exclusive control and management of such institution for and in the name of the State, and shall have the possession and care of all the property of the association, and shall fix the terms of office, and the bonds of the Secretary and Treasurer, and determine their salaries and duties. They shall have power to make all necessary by-laws, rules, and regulations for the government of the association and the management of its prudential and financial affairs. They shall provide for an annual Fair or exhibition by the association of all the industries and industrial products in the district, at such time and place as they deem advisable; *provided*, that no District Fair shall be held in any of the districts at the same time of the State Fair; *and provided further*, that the State shall in no event be liable for any premium offered, or award, or for any debt contracted by any District Board of Agriculture, or Agricultural Association.

SEC. 18. When any District Board of Agriculture shall have been classified and organized as herein provided, the Secretary of the Board shall report such classification and organization to the State Board of Agriculture; he shall also report the same to the Governor, and shall report any vacancy that may occur in the Board to the Governor, who shall fill the same by appointment for the unexpired term.

SEC. 19. All laws and parts of laws in conflict with this Act are hereby repealed.

SEC. 20. This Act shall take effect from and after its passage.

OPENING ADDRESS.

Delivered in the Pavilion, Sacramento, Tuesday Evening, September 21, 1880, by H. M. Larue, President of the State Board of Agriculture.

Ladies and Gentlemen: Long established custom has assigned to the President of the State Board of Agriculture the duty of extending a formal welcome and courteous greeting to members of the State Agricultural Society and visitors to the annual exhibition. It is also an established custom on these occasions to inaugurate the annual exhibition by the formality of an opening address. In its inception, nothing beyond the welcome already alluded to, and an official declaration that all parts of the exhibition were completely organized, and fully opened to inspection, was contemplated by this ceremony. But custom has enlarged upon this original idea, and has expanded the opening address into the proportions of an annual message from the executive head of the society, in which the largest latitude in the way of report, suggestion, and discussion has been indulged.

In discharging the duty thus made incumbent upon the President of the State Board of Agriculture, permit me to call your attention, first, to the changes made in the laws of our State concerning the organization, appointment, and powers of the Board. Very early in the history of this State, the people recognized the great educational advantages of agricultural and mechanical exhibitions, and the value to intelligent industry of agricultural and mechanical societies. The law organizing a State Board of Agriculture, and incorporating the State Agricultural Society, was among the earliest placed upon our statute books.

From time to time liberal appropriations from the State Treasury in aid of the Society, and in promotion of its annual exhibitions, have been made. But the new Constitution, ratified in eighteen hundred and seventy-nine, contained a sweeping prohibition against appropriations from the public treasury for the benefit of any corporations or associations not under the exclusive management and control of the State. While under the law of eighteen hundred and fifty-two the State Board of Agriculture was the creature of the State, and while by that Act a Department of Agriculture was created as a department of State government, still the members of the Board were chosen by annual mass meetings of members of the State Agricultural Society, in which only members of the Society were eligible to vote. The State Agricultural Society also possessed the right of control of the annual exhibitions, and the power to adopt, alter, or amend the articles of association and the rules governing the Board. The corporation was not under the exclusive control of the State as a distinctively State institution, and therefore within the category of associations ineligible to receive any gift, grant, aid, or subsidy from the State Treasury. All this has been changed. By the Act of eighteen hundred and eighty the Board of Agriculture is appointed by the Governor of the State. All laws, rules, articles of association, with all legislative authority formerly belonging to the State Agricultural Society, are now by law vested solely in the Board of Agriculture.

This, the twenty-seventh annual exhibition of the Society, is the first held under the new order of things. The law creates a Board of twelve Directors, and requires the appointment of the members thereof by the Governor. At the last annual meeting of the Society, three members were elected for the ensuing three years. At the close of that meeting the Board, as constituted, stood as follows: H. M. Larue, L. U. Shippee, S. J. Rose, G. W. Hancock, D. Flint, G. W. Colby, R. H. Newton, Cyrus Jones, W. P. Coleman, P. A. Finigan. The Governor of the State, in making appointments to fill the twelve positions created by law, appointed all the members of the Board as constituted by the State Agricultural Society, adding two additional names—M. D. Boruck and John Boggs—to complete the additional number. Thus, the organization appears to be identical with that existing before the passage of the law of eighteen hundred and eighty; but, in fact, the entire legal aspects of the Board and Society have undergone a complete revolution. A Department of Agriculture has been established as a department of State government; the members of the Board of Agriculture are State officers, and the rules of this exhibition, have the sanction of statutory law; the exhibition itself is held by the authority and under the protection of law; the objects and aims of the State Agricultural Society have been indorsed by this commonwealth; the whole people constitute its membership; while its transactions and exhibitions, its efforts to dignify and ennoble labor, disseminate information on subjects of practical and scientific agriculture, manufactures, mechanics, mining, and the fine arts, have been placed side by side with the State University and the common schools—a recognized department in the great system of public education. In the law under consideration, the State Agricultural Society is fully recognized. Its mission is by no means at an end. Its annual meetings will still be continued, and relieved from many elements of contention growing out of succession in office. The Society can address its efforts to still higher achievements in consonance with the aim of its founders. The Agricultural Societies of California have accomplished more for the cause of practical education than all the schools of the State. The public recognition of the importance of this department of public instruction is a high achievement, the honor of which belongs to the State Agricultural Society. But there remains other and higher work to be performed; and, judging from the past, I am justified in believing that the State Society will not be found wanting in that zeal for which it has been so distinguished.

The past season has been one of unusual productiveness. The yield of all the staples has been satisfactory. There has been failure in none. The wheat harvest, however, offers the broadest field of suggestion, and to the lessons derived from the experiences of this year I will devote the full limit of this address.

The product of the harvest has been variously estimated at from eight hundred thousand to one million two hundred thousand tons. From reliable data I accept the mean figure between these extremes, and adopt the sum of one million tons as the aggregate yield of the season. This I am fully persuaded is not an overestimate. At the low market rate now ruling this wheat is worth twenty-five million dollars. The north winds of March and April inflicted great injury upon the growing wheat in many localities, reducing the yield from thirty to forty per cent. below a full crop. The somewhat unusual occurrence of seeing the wheat appear to ripen twice in the same season was witnessed this year. After harvesting had begun in many cases the apparently dried stalks freshened, and the process of filling was resumed. This did not, however, fully compensate the bad effects of the north wind. The aggregate yield has far-reaching significance. It establishes the persistency of the wheat-growing capacity of our soil. Many of our friends who farm with the pen rather than the plow, have been warning us that our lands were worn out. In some years past the average yield per acre had fallen so low that many felt a serious discouragement. It was the honest belief of many that the day of large crops had passed for California. The splendid yield of this year proves that the character of the season has almost everything to do with the fluctuations of the yield from year to year. The present season has clearly demonstrated the fact that the fertility of our oldest wheat lands is by no means exhausted. The harvest of this year has furnished countless instances where lands which have been cultivated to wheat for a long series of years returned a crop equal to the yield of virgin soil. In fact, it is the universal opinion of all well-informed men that but for the deleterious effect of the north wind early in the season, the average yield of this year over the entire State would have been equal to the best average ever noted. As it is, however, if we exclude the localities injured by the unfavorable character of the season, the average yield per acre is fully equal to the best average ever attained in any former season. I desire to be understood not as undervaluing the rotation of crops and the many highly valuable suggestions for restoring to the soil its depleted fertility.

I desire, in this connection, simply to assert what has been fully established by the crop production of last year, to wit: that the wheat lands of California are not depleted, and that in seasons equally favorable with those of former years, particularly those years which are noted in the agricultural history of the State for the high average yield per acre of their harvests, with a recurrence of the same character of season, we find a recurrence of the same high average yield of wheat per acre. We have set the production of wheat in this State for this year at one million tons, which is equal to thirty-three million bushels, and valued at twenty-five million dollars. In comparison with some other States of the Union, this amount does not appear to be a very large production, but when we come to consider the comparative agricultural population of these States, the productive capacity of our soil and climate is brought into view. The entire population of California is about eight hundred thousand. Of these, one third are engaged in mining, one third more form the metropolitan and manufacturing population of the State, leaving about one third of the entire population engaged in agricultural pursuits, or less than three hundred thousand people.

The State Board of Agriculture for the State of Illinois reports the wheat product of that State for this year at forty-six million bushels, but the State of Illinois contains about two millions four hundred thousand inhabitants, at least one million five hundred thousand of whom are operative agriculturists—an agricultural population five times that of the State of California. The large yield of the harvest of this year having established the persistence of our wheat-growing capacity, the next question is how much land remains to be added to the wheat-growing acreage of the State. I am persuaded that already the best wheat-growing sections of the State are fully under cultivation of that cereal, except such sections as require irrigation to make them productive. With the aid of irrigation, however, the wheat lands of San Joaquin Valley alone are capable of producing a larger annual yield than the entire production of the State for this year. There are also lands in the sections of the State possessing sufficient annual rainfall to make a crop, which have not as yet been brought under cultivation. It is probably no exaggeration to claim for California a possible annual production of wheat equal to one hundred million bushels. This is presented as within the reach of early possibility.

The problems of both the present and future are transportation and market. We have from the harvest of this year a surplus for export of eight hundred thousand tons. To reach its market this wheat must be transported to the seaboard by rail and thence by ocean around Cape Horn to Liverpool. This is the longest voyage made upon the earth for commercial purposes. Our wheat must make a longer voyage and pay a higher rate of transportation than any offered in the market at Liverpool. Owing to this great distance we cannot take advantage of the rise in the breadstuffs in Europe, because we cannot reach the European market until the demand has been in a great measure supplied from the wheat ports of our Atlantic seaboard and of the Black Sea. A rise in the prices of breadstuffs in Europe to-day, which would cause a general movement of wheat from the interior to the seaboard, would at once overtax the carrying capacity of the railroads and the rivers of California. The first great need of the producers of this State is cheap warehouse facilities at tide-water. This is the one imperative necessity of the California farmer. As soon as the harvest begins the wheat should be moved to the seaboard and stored in warehouses accessible to sea-going vessels. We have produced thirty-three million bushels of wheat, but when we offer this in the market we find a combination of forces producing a low price. The market is in the hands of merchants, commission men, and brokers. The large yield for export has raised the rate of ocean tonnage, while the storage capacity of our warehouses is hopelessly inadequate. To overcome these disadvantages it will be necessary to form associations of wheat producers to build and own wharves and warehouses at the seaboard. These associations, holding large quantities of wheat ready to ship, could be placed in receipt of the same information as to movements in breadstuffs in the leading markets of the world, now monopolized by the commission merchant.

The great natural outlet for the products of the Sacramento and San Joaquin Valleys is at the Straits of Carquinez. It is already clearly manifest that this natural outlet will, in the near future, be the point of the largest export commerce of any port on the Pacific. Whether by rail or by water, all commercial lines converge at Carquinez. The construction of warehouses and wharves at that port of sufficient capacity to answer the demands for storage of our export surplus, would confer the largest benefit upon the grain producers of the State. But the grain growers can confer this great benefit upon themselves, and to the advantage of facilitating the surplus product to its market, add the saving of commission and brokerage, and reap the profit of wharfage and storage. The aggregate of these items upon this year's surplus will not fall short of three million dollars. I most earnestly commend this suggestion to the careful consideration of the intelligent and enterprising farmers of this State.

During the year our State has been visited by a gentleman holding credentials as Commissioner of Agriculture for the Government of Great Britain. The object of his visit to California was to ascertain, first, our capacity for the production of breadstuffs and beef, and second, the probable future persistency of this capacity. This inquiry on the part of the Government of Great Britain grows out of the fact that the facilities for transportation of beef and breadstuffs are such, that they may be produced in this country and transported to the consumers in England cheaper than they can be produced on the other side of the ocean.

The freight rates from the great centers of the West, and from the Atlantic seaboard, are so low that the beef and breadstuffs raised in Nebraska and Kansas are delivered in the markets of England at a rate below the cost of home products of that country. The question is already mooted, as to whether the lands of England and Ireland may not be more profitably devoted to other products than breadstuffs and beef. The present disturbed relation between the tenantry and the landlords of Ireland, grows out of the fact that the staple articles of human food are produced in America and transported at such low rates as to very greatly reduce the profits of the tenants, thus reducing his ability to pay the rents heretofore obtaining. It is already manifest that America will raise all the breadstuffs and beef for the European market, and more than successfully compete with the production of these staples in those countries. This result is due to two leading causes: First, the progress made in the invention and application of agricultural machinery. Within a quarter of a century the labor of each operative agriculturist has been supplemented by labor-saving machinery, augmenting the productive power to an almost incredible degree. It is the sober conclusion of investigators, that the agricultural machinery employed in the United States is equal to the productive capacity of three hundred million men. A single farmer in this State has, chiefly through the aid of agricultural machinery, raised nearly one million bushels of wheat in a single season. There is an instance in this State of a single farm of fifty thousand acres being cultivated by the employment of less than three hundred men. Before the advent of machinery, the same results could not have been attained by the employment of five thousand men.

The second cause is to be found in the increased facilities and constant downward tendency in rates of transportation. The beef raised in the very heart of this continent, even at the foot of the Rocky Mountains, is served fresh on the tables of England. In both these directions the limit of possibilities has not been reached. We have scarcely entered the broad domain of labor-saving invention, while the great science of transportation is scarcely beyond its first infancy. From where we now stand we see approaching the time when the fruits of our valleys will appear on the tables of London and Paris as fresh as when picked from the tree and vine. Estimated by a comparison of the cost and facilities of transportation, San Francisco is nearer to London to-day than the City of Buffalo was to the City of New York at the beginning of the century. The unmistakable ten-

tency is to cultivate every product where nature lends the largest measure of assistance. The great advancement made in the means of transportation and communication is working radical changes in the industrial pursuits of the world. The grain fields of the West have forced the almost entire abandonment of grain growing in New England for the more diligent and more profitable attention to dairy products. In this we find an instance fully illustrating the tendency already alluded to. The same principle has equal application to all productions, whether of the farm or the factory. The peculiar and special advantages possessed by any locality inures to the benefit of all the world. The distribution and assignment of all productions to the soils and climates best adapted to their growth, will prove as advantageous to mankind as has been the division of labor into the various trades, arts, and professions. In the production of breadstuffs California possesses in her peculiar climate an advantage enjoyed by no other country of which we have any knowledge. I refer to the absence of rain during the period of harvest. In all other wheat regions of the world inclement and unfavorable weather during harvest time is one of the leading obstacles to successful wheat farming. Rains and storms during the period of harvest throughout the temperate zone often inflict the heaviest damage, not infrequently resulting in the total loss of crops. In California a disaster from this source is never known or apprehended. From May to November our grain ripens and is harvested under cloudless skies. This is an advantage not easily over-estimated.

The question as to whether all these great discoveries of science and mechanical inventions, by which the productive capacity of men is increased and manual labor saved, tend to disturb the more equal distribution of wealth, and increase the disparity of condition between the rich and the poor, is one that has engaged the attention of the most profound thinkers and employed the pens of the ablest writers of modern times. I do not propose to enter the arena of discussion with these learned men, either to dispute or agree with their conclusions. I do, however, beg your indulgence while I present a few obvious considerations bearing upon the general subject of the effect of all progress in labor-saving discoveries and machinery. Labor is the chief factor in the production of wealth. Wealth, then, as the product of labor, must become more easily attainable in proportion as the facilities for its creation increases. The harvesting machinery and the more scientific methods of agriculture may diminish the demand for labor in the production of bread, but the cost of bread will be correspondingly diminished. The wants of civilized men multiply and increase with the possibilities of supplying them, and rise higher as the problem of supplying the more primitive wants reaches a more satisfactory solution. The demand for labor to supply the higher comforts and the intellectual wants of life increases in exact proportion as the demand for labor to supply the physical want diminishes. The list of occupations increases with every new census. New industries and new arts are constantly being added to the profitable occupation of industry. These new occupations relate to the higher tastes and aspirations as mankind is elevated from lower to higher planes of civilized want.

The close identity between the interests of production and transportation justifies some reference to the approaching completion of the Southern Pacific Railroad. I have already alluded to the problem of transportation as a leading factor in the profitable production of our staples. The completion of the Southern Pacific Railroad will have an important bearing upon all the leading industries of this State. When the great wheat-growing valleys of California are connected with New Orleans by rail over the level grades of the southern route, the commercial lines to the final market for our wheat will be shortened by ten thousand miles. We will then have a constantly operative means of transportation at what I have reason to hope and believe will be reduced rates. The average inland tonnage on our grain now is about three dollars and fifty cents per ton. The average ocean tonnage to Liverpool about thirteen dollars per ton, aggregating sixteen dollars and fifty cents per ton from the station or landing to the ultimate market. By the Southern Pacific Railroad the pro rata of ocean to rail transportation will be reversed. The tonnage rate from New Orleans to Liverpool will not exceed five dollars per ton. Thus leaving eleven dollars and fifty cents per ton as the pro rata to rail transportation, and without increasing the aggregate rate. If expectation in this direction is well founded, the wheat product of California will possess higher advantages in the market than hitherto enjoyed. The completion of this southern route will introduce the now wanting element of competition with the long voyage around Cape Horn. It will also enable the shipper to receive quicker returns. Its further advantages will be found in the opening of markets for the orchard and dairy products of Southern California, and it is within the range of possibilities to ship green fruit and fresh beef to the English market by that route. At this time fresh beef is shipped from points on the Missouri and Mississippi Rivers by way of New Orleans to England, and the time from Sacramento by rail to the Crescent City is shorter than the time from Kansas City to the same point by water.

For the first time in the history of this Society our annual exhibition is honored by the presence of the Chief Magistrate of the Nation. As a pioneer, looking back to the early isolation of this State, this event has more significance than it can have for those whose residence in California dates since the era of transcontinental railroads. It impresses upon my mind a most forcible realization of the wonderful changes a few years have wrought in the means of communication. From the capital of this great republic, on the opposite shore of this mighty continent, the President of the Nation comes as a visitor to spend a few days with us, and then to return to the seat of government, having enjoyed but a brief vacation from the full burden of official duty. None but a pioneer can know how grateful is the task of extending to him a welcome among us, for none but a pioneer can so well feel that by his presence here we realize anew the nearness of this land of our love and adoption to the homes of our early and hallowed associations. His Excellency will never realize a continent so broad in extent as that still lingering in the consciousness of those who made its transit by ox teams. He will scarcely comprehend the vastness of mountain ranges existing in the geography of those only who toiled on foot up their wearisome slopes. But it will be borne in upon our people by his coming here that all parts of our beloved country are being brought closer and closer together by the discoveries of science, the triumphs of skill, and the energies of our civilization. These combined have annihilated time and space, until no part of our common country is distant, no portion of our people neglected or forgotten. In honoring the President of this Nation, we do homage to the dignity and majesty of the people. On behalf of the State Board of Agriculture and the members of the State Agricultural Society, I extend a sincere welcome to the President of the United States to this annual exhibition.

And finally, let us remember the labors of the past year only in the light of the blessings honest toil ever confers. We sowed the seed in hope and trust ; we have garnered a bountiful harvest with earnest gratitude. From the path of every industry we have come, bringing the fruits of our toil, the skill of our hands, the inventions of our genius, the inspiration of our minds. All are trophies of that peace and prosperity which rests like a benediction upon our loved California and our honored Nation ; and not unmindful of that devout gratitude due to the bountiful Giver of all good, I now declare the twenty-seventh exhibition of the State Agricultural Society of the State of California duly open.

ANNUAL ADDRESS.

Delivered by Hon. Horace Davis before the California State Agricultural Society, at Sacramento, September 23, 1880.

Mr. President, Ladies and Gentlemen: I have been asked to address your Society regarding the need of a Bureau of Agriculture, whose special province shall be to examine the conditions of farming on this coast and minister to its wants. The need of such a provision was first suggested to me some years ago by a distinguished citizen of this city, and it impressed me as a public want. I saw that the researches and the publications of the Agricultural Department had been hitherto almost totally occupied by subjects of interest to the Eastern farmer, while the new methods of farming and the new products of this Western coast were wholly unnoticed. As I revolved in my mind, I saw a difficulty in obtaining an appropriation for such a bureau, based simply on a sectional or geographical distinction, but I thought the radical climatic differences between the extreme East and the country west of the Rocky Mountains, which are reflected in their different methods of agriculture, might justly demand some consideration. Prof. Hilgard, in a thoughtful paper published in the Agricultural Report of eighteen hundred and seventy-eight, says: "The salient climatic feature of California is that practically all the water relied on for the production of crops falls between the middle of November and the first of April" (I would have said the first of May). "It is during this period that the crops are made or undone." This diversity of condition between a country amply supplied with rain all the year round, like the Atlantic States, and one scantily watered or where a rainless period of months intervenes between the wet seasons, this difference, I say, lies at the root of most of the changes we have had to make in the old methods of farming, and might justly call for a separate bureau, or at least the detail of a special officer to observe and collect facts for publication when such an expenditure could not be demanded merely on the grounds of geographical distance.

You will all remember how little faith we all had in early times in California farming. To a man from the Atlantic States, with their copious rains in every month of the year, where the soft green sward covered the pastures in Summer—where every unoccupied spot was clothed in forest, where nature from May to October wore her brightest and most winning dress—to such a man it seemed absurd to attempt to till these dry plains and bare brown hills. We then thought that when we had exhausted the crop of gold the country would be worthless, and we should all abandon it to the Mexican and his mustangs. We forgot that nature's means and methods were infinite, that there were many paths to success in tilling the soil besides those we had trod in our early days; we were blind to the hints she threw out to us on every side. The waving fields of wild oats were a prophecy of the abundant grain crops of to-day; and in the scattered trees along the lines of the water courses, she told us that with man's aid and patient labor the broad, desolate plains might be decked with trees and dotted with pleasant homes.

Slowly and with patient steps the farmer learned to accord his ways to hers. Much of the old wisdom had to be unlearned and a world of new experience took its place. But, to-day the farming product alone of California is far greater than her yield of precious metals in the palmiest days of her mining interests.

Our sturdy farmers have wrought these changes by themselves, without aid, hint, or suggestion from the National Department of Agriculture. They feel now that with this immense showing of results they are strong enough to demand some recognition from the Department, and they plead in justification of their claim the radically different character of farming, resulting from climatic peculiarities extending over nearly half the area of the United States.

The Committee on Agriculture in the present Congress, in accordance with my request, supported by such arguments as I was able to offer, and by the action of the State Grange of California, inserted in their appropriation bill the following clause: "For the purpose of enabling the Commissioner of Agriculture to procure data touching the agricultural needs of the arid region of the United States, five thousand dollars." This was meant rather as an entering wedge to lead to greater results if the experiment was successful. Some fun was indulged in at my expense at the time of its passage, but the language was carefully chosen to avoid geographical or sectional jealousies, and yet include the most salient points of our agriculture on this coast.

Major J. W. Powell, in his able "Report on the Lands of the Arid Regions of the United States," says, "the arid region begins about midway in the great plains and extends across the Rocky Mountains to the Pacific Ocean," which includes roughly that portion of our country where the annual rainfall is less than twenty inches, which amount he deems necessary for uniformly successful agriculture from season to season. From this region he excepts western Washington, western Oregon, and northwestern California. You will observe that this definition includes most of the State of California as a region where the rainfall is deficient, and a region to be largely benefited by irrigation, even where it does not absolutely require it, and where, in short, the agriculture is seriously modified by these climatic conditions.

This is no time to discuss the problems of farming under such conditions, but I may be pardoned for pointing out some of the peculiarities of the arid regions.

First we notice the greater presence of what we call "alkali" in the soil, "a name," says Professor Hilgard, "used to designate any soil containing such unusual quantities of soluble salts as to allow them to become visible on the surface during the dry season, as a dry crust or efflorescence." The best methods of handling these soils, unknown in the lands of bountiful rains, may well form a problem for the consideration of our special bureau.

Another marked feature of this region is the lack of timber, which is found in very scant supply on the higher ranges of mountains.

Here in California our people have spent millions of dollars experimenting on different varieties of trees from all parts of the globe, trying to relieve the monotony of our monotonous treeless plains and bare hills, and clothe them with verdure.

The same problem confronts the State of Nebraska, and, as you whirl through the Valley of the Platte, you see there, as you may in some parts of California, thousands of acres of artificial forest. On the other hand, it is interesting to observe how in our own State the young trees are spreading over the lower slopes of the Sierras and the foothills since they have been protected from fires. How interesting and valuable an investigation of this subject might be made.

The absence of true feed grasses is another peculiarity of this dry region. Professor Hilgard says that meadows and permanent grass pastures, and even clover, are practically eliminated from the agricultural system of this State. They are possible only where artificial or natural irrigation supplies moisture throughout the season. "This absence of grass makes necessary the cutting of the ordinary cereal crops for hay before the grain ripens," and "wheat hay and barley hay are among the California oddities that first strike the agricultural immigrant." Here the department might help us to find substitutes—new forage plants, native or foreign, which will live through our dry seasons. The thrifty economical Eastern farmer, coming here in the Fall, is amazed to see the sky lighted at night by fields of blazing stubble. His California friend justifies the practice by telling him that the soil in many sections becomes so parched and dry that stubble, and even manures, when turned in by the plow, will not decay, but remain a hindrance, and not a help, to the farmer, and his only method to get rid of the stubble and straw is to burn it.

The same dry soil furnishes a comfortable home for those various pests of the farmer which find their breeding place in the ground, and they increase indefinitely, to his great annoyance. He wages perpetual war against the insects and ground squirrels, while the heavy rains and inclement Winters which in the East destroy such pests and keep them within bounds, are wanting here, and but for an exceptionally wet Winter once in awhile, nature gives him no help in his warfare. On such points as these an intelligent research by the Department of Agriculture would be of great assistance.

I might add indefinitely to this list of differences, but it is not my province. One more instance and I will close the catalogue. The science and practice of irrigation are peculiar to this arid region. While many parts of California do not require it, others can do nothing without it, and almost everywhere it is helpful. Irrigation almost reverses the natural conditions of agriculture. When the eastern farmer has bought his land, Providence supplies the blessed rain from heaven "without cost," and his crops mature without future expense. But here the water-right often costs more than the land—indeed, gives it its chief value. On the other hand, the irrigating farmer can gauge the supply of water to suit his crops, and fears neither droughts nor floods. But I must not enter on so vast and attractive a subject as the science of irrigation. Its means and methods will be a study for our farmers for generations to come, and its possibilities are almost beyond conception. A scientific study of its operations is one of our greatest needs.

All these and kindred topics are to be investigated. Each subject opens a world of inquiry and calls for most careful study. Nor will this be the only good you will derive from this new departure. If the experiment is successful, and it becomes a settled practice of the department to detail an officer to specially note the wants of this coast, he will soon take cognizance of our other peculiar productions, even such as have no especial connection with our dry seasons. Our great wine interest, destined I believe some day to overtop all other agricultural interests in this State, and to rival in fame the choicest vintages of France; our semi-tropical belt of oranges, figs, olives, and bananas; the increasing industry of dried fruits, which will at no distant day drive out from our market the corresponding products of the Mediterranean; all these and other kindred interests will come in for a share of attention, and will be helped by having an officer of the department here to note their wants and to proclaim their promise.

I have been asked how this five thousand dollars could, in my judgment, be made to produce the best result—and let us be sure and get the very best result, so that we can point to what it has produced when we ask for more.

General Le Duc, the Commissioner of Agriculture, hopes eventually to establish experimental farms, such as are maintained by some of the European Governments and by a few of our Atlantic States, or at least experimental stations, where some zealous farmer may, with a little aid from the Government, make experiments for the benefit of the public—and that is what a great many of you are doing all the time, only you pay the bills yourselves. But this small sum will hardly suffice for an experimental station except on a small scale.

Meantime I understand General Le Duc will be here soon after the Fair, and he will consult with your officers as to the best method of spending this money.

If I may make a suggestion, I would offer a small portion of it as a prize for the best essay on the conditions and wants of agriculture in the arid region of the United States; meaning by that, wherever the rainfall is deficient and irrigation is helpful. Such a paper, carefully prepared by a thoughtful man, either on the general problem of agriculture in countries deprived of rain for long periods each year, or deficient in supply for the entire twelve months; or a paper treating of any of the special questions, such as I have suggested above, if published in the agricultural report would excite deep interest among our Eastern brethren, and would, I am sure, bring out a rich fund of personal experience from our own midst—and this is just what we want. The accumulation of personal experience constitutes all our civilization; a single fact is perhaps worth little, but when reinforced by a succession of similar facts, it becomes a law of nature, and we can follow it as a guide in life.

Each man's experience forms part of the evidence that establishes the law; and if we can do nothing else, we can use this small appropriation to collect facts, or, in the words of the appropriation itself, to "accumulate data" and publish them, respecting our peculiar agriculture. Follow this carefully, glean the experience of every farmer on doubtful points, and you soon gain a mass of facts that will serve as a guide for every-day life.

And let me entreat you not to let this humble beginning perish for want of attention. Strengthen the hands of your Representatives in Congress by commending this matter to their care. You are entitled to this consideration from Congress; now demand it as a right, and you will be listened to. Correspond with similar societies in neighboring States, and urge them to like action, and from this little germ you will raise a Pacific Bureau of Agriculture which will be an inestimable blessing, a treasury of facts from which you may deduce your line of daily action.

Your profession underlies all civilization. When the wild hunter puts in his first crop of corn, he takes the first step in unending progress; he is then on the high road to civilization and humanity. And the plane of a nation's progress may almost be reckoned by the stage of its agriculture.

The rude branch which served as a plow to scratch the surface of the soil for the Mexican is a type of his retarded development, while the steam plows and the ponderous header mark the achievements of modern progress. Your prosperity underlies all the prosperity of society. Your products freight the railroads and furnish the cargoes of the ships; to-day they yield the balance of trade which brings peace and plenty to our favored land. You not only feed the hungry and clothe the naked, but all the business of the country trembles in the balance till Providence determines the quality and quantity of the crops.

Congress may well recognize this interest as the foundation of all prosperity, and none too soon have they provided for the intelligent development of agriculture. The men of the East have profited by this for many years, while you have struggled single-handed and alone to build up here a new science of agriculture. Alone and unaided you have encountered these problems; wringing from nature her secrets, by unwearied effort and at great cost you have put them to practical use, till to-day the agricultural products of California exceed all her other annual increase of wealth.

Your results challenge the admiration of the country, and at last you are granted a tardy recognition and a chance to record and compare your experience.

The domain of truth is much like the farmer's field of work. Some soils are easily tilled, others can only be broken up by patient labor and in a favorable season. In some the underbrush and old stumps of error must be cleared away before a harvest can be gathered. Some men only scratch the surface, and, going on in the same old routine, grumble at their light crops. Others plow deep, and turning up constantly virgin soil, are rewarded with new ideas and new experience.

This special bureau gives you a new worker in the field. Get it well in harness, and you will plow deeper than ever, turning up rich, new soil at every step, and I hope a bountiful harvest will follow.

ANNUAL MEETING.

The fiscal year ending on the first day of February, the annual meeting of the Board was called for February 7th, 1881.

At the meeting on this day there were present President Larue and Directors Shippee, Chase, and Hancock. The absence of members was attributable to the prevalence of a heavy storm and high water. There being no quorum, the Board adjourned to meet Monday, the 28th instant, at two o'clock P. M., at which date the Board was again called to order, with President Larue in the chair, and the following named Directors present: Shippee, Finigan, Coleman, Newton, Rose, Hancock, Flint, Jones, and Chase. Absent, Directors Colby and Boggs.

After the consideration of some unimportant business, and the auditing of sundry bills, the President, on behalf of the Board, presented Director Flint, whose term was about to expire, with a silver pitcher, properly inscribed, in recognition of services rendered the society as Superintendent of the Park, for which Mr. Flint returned thanks in a few appropriate remarks.

The Board of 1880 then adjourned *sine die.*

NEW BOARD.

The Board of 1881 convened, with President Larue in the chair.

Hon. J. McM. Shafter and Hon. Christopher Green presented their commissions and qualified as Directors, vice G. W. Colby and Daniel Flint, whose terms had expired.

Hon. J. D. Carr, appointed to succeed Cyrus Jones, not appearing, Mr. Jones continued to act until his successor shall have qualified.

Upon the roll being called the following Directors were found to be present: Larue, Shippee, Finigan, Coleman, Newton, Rose, Hancock, Green, Jones, and Shafter. Absent, Boggs.

President Larue made a few remards as a valedictory, thanking the members for their universal courtesy to him, and relating certain charges that had been made against him in connection with the non-admission of persons into the Directors' Stand on the day of the reception of President Hayes and party at the last Fair, claiming that he acted in conformity to the resolutions and orders of the Board in the premises.

The Secretary was ordered to read the resolutions and orders relating to the subject, after which Director Rose offered the following resolution, which was unanimously adopted:

WHEREAS, Complaints have been made against Mr. Larue, the President of this Society, relating to the exclusion of persons from the stand during the Presidential visit of last year; upon reading the resolutions and orders of this Board relating thereto,

Resolved, That the action of the President complained of was in fulfillment of such orders, and that we regret that the persons complaining were not admitted, there being no slight intended, and if they had applied for admission at the proper source, that it would have been pleasing for the President of the Board to have complied with their wishes.

Upon reconvening, at eight o'clock P. M., the Board proceeded to elect a President, from one of their number, for the ensuing year. Nominations being in order, Director Newton nominated Hon. H. M. Larue, the present incumbent; Director Finigan nominated Hon. J. McM. Shafter; and Director Green nominated G. W. Hancock, Esq.

On motion, Directors Chase and Newton were appointed tellers.

FIRST BALLOT.

Whole number of votes cast	11
Necessary to a choice	6
Mr. Larue received	5
Mr. Shafter received	3
Mr. Hancock received	3

Neither candidate having received the requisite number of votes, another ballot was ordered.

SECOND BALLOT.

Mr. Larue received	3 votes.
Mr. Shafter received	3 votes.
Mr. Hancock received	5 votes.

Same result.

Mr. Larue withdrew his name as a candidate, stating that it was a well known fact that he was not desirous of, nor would he accept the office for another term. In fact, had he not received the positive assurance directly from six members of the Board that they would support him, he would not have allowed his name to have been presented.

THIRD BALLOT.

Mr. Hancock received	5 votes.
Mr. Shafter received	5 votes.
Mr. Rose received	1 vote.

Same result.

FOURTH BALLOT.

Mr. Hancock received	5 votes.
Mr. Shafter received	5 votes.
Mr. Rose received	1 vote.

Same result.

Mr. Rose declined to serve if elected.

FIFTH BALLOT.

Mr. Hancock received	4 votes.
Mr. Shafter received	5 votes.
Mr. Rose received	1 vote.
Mr. Green received	1 vote.

Same result; no election.

SIXTH BALLOT.

Mr. Shafter received	5 votes.
Mr. Hancock received	4 votes.
Mr. Newton received	1 vote.

Same result.

SEVENTH BALLOT.

Mr. Shafter received	5 votes.
Mr. Hancock received	5 votes.
Mr. Jones received	1 vote.

Same result.

EIGHTH BALLOT.

Mr. Shafter received	5 votes.
Mr. Hancock received	5 votes.
Mr. Chase received	1 vote.

Same result.

Director Rose moved that a recess of ten minutes be taken, upon which the ayes and noes were demanded, and the motion was lost by the following vote:

AYES—Directors Larue, Shippee, Rose, Chase, and Shafter—5.
NOES—Directors Finigan, Coleman, Newton, Hancock, Jones, and Green—6.

The ninth ballot was then ordered, with the following result:

Mr. Shafter received	5 votes.
Mr. Hancock received	5 votes.
Mr. Coleman received	1 vote.

No election.

The tenth ballot resulted in the election of Honorable James McM. Shafter as President of the Society, for one year, by a vote of six to Mr. Hancock's five.

Director Hancock introduced President Shafter, who, in a few well chosen remarks, thanked the Board for the honor conferred, and promised to faithfully serve.

The election of a Secretary being next in order:

Director Newton nominated I. N. Hoag, present incumbent.

Director Finigan nominated Edwin F. Smith.

FIRST BALLOT.

Mr. Hoag received	5 votes.
Mr. Smith received	5 votes.
Blank	1 vote.

Neither candidate having received a majority of all the votes cast there was no election, and another ballot was ordered.

SECOND BALLOT.

Mr. Hoag received	5 votes.
Mr. Smith received	6 votes.

Mr. Smith having received a majority of all the votes cast, was declared elected Secretary.

TREASURER.

Upon motion, L. A. Upson was unanimously elected Treasurer.

PARK SUPERINTENDENT.

On motion of Director Coleman, G. W. Hancock, Esq., was unanimously chosen Superintendent of the Park.

SUPERINTENDENT OF THE PAVILION.

Mr. Shippee nominated Director Coleman, and the Secretary was directed to cast the ballot.

The President named the following committees:

On Finance—Directors Green, Coleman, Chase, Hancock, and, on motion of Director Finigan, the President was added thereto.

On Library—Directors Jones, Finigan, Rose, Green, and the Secretary.

On Printing and Publication—Directors Hancock, Green, Coleman, together with the President and Secretary.

SPEED PROGRAMME.

Director Shippee moved that a committee, consisting of three Directors, to be named by the President, whose duty it shall be to arrange and prepare a speed programme for the next Fair, and report the same for consideration by the Board at the next meeting.

Director Hancock moved as an amendment that five be named instead of three; the same being accepted by Mr. Shippee, the motion amended was adopted, and the President named as such committee, Directors Shippee, Finigan, Chase, Rose, and Green.

The Board next proceeded to revise the old and arrange a new Premium List for the annual exhibition to be held from September 19th to 24th, 1881.

The Finance Committee made a report that they had examined the accounts of the retiring Secretary and found them correct.

After further consideration of other unimportant measures the Board, on motion of Director Chase, adjourned to meet Monday, April 11, 1881, at three o'clock P. M.

NOTE—Hon. J. D. Carr, appointed to succeed Cyrus Jones, afterwards duly qualified and assumed the position of a member of the State Board.

STATEMENT OF RECEIPTS AND DISBURSEMENTS—1880.

RECEIPTS.

Date.	From What Source.	Amounts.	Totals.
1880.			
Jan. 20	Balance as per bank book		$1 94
Jan. 20	Annual memberships	$130 00	
Sept. 3	Annual memberships	5 00	
Sept. 15	Annual memberships	10 00	
Sept. 17	Annual memberships	205 00	
Sept. 19	Annual memberships	274 50	
Sept. 20	Annual memberships	3,500 00	
Sept. 21	Annual memberships	1,450 00	
Sept. 22	Annual memberships	640 00	
Sept. 23	Annual memberships	270 00	
Sept. 24	Annual memberships	45 00	
Sept. 25	Annual memberships	3 00	
			6,532 50
Sept. 3	Life membership, F. P. Lowell	$50 00	
			50 00
Sept. 20	Single admissions	$387 00	
Sept. 21	Single admissions	979 00	
Sept. 22	Single admissions	3,047 50	
Sept. 23	Single admissions	2,451 00	
Sept. 24	Single admissions	1,995 50	
Sept. 25	Single admissions	1,273 00	
			10,133 00
Sept. 20	Quarter-stretch badges	$225 00	
Sept. 21	Quarter-stretch badges	110 00	
Sept. 22	Quarter-stretch badges	30 00	
Sept. 23	Quarter-stretch badges	30 00	
Sept. 24	Quarter-stretch badges	2 50	
			397 50
Sept. 20	Receipts of Special Stand	$289 00	
Sept. 21	Receipts of Special Stand	85 50	
Sept. 22	Receipts of Special Stand	225 00	
Sept. 23	Receipts of Special Stand	105 00	
Sept. 24	Receipts of Special Stand	106 00	
Sept. 25	Receipts of Special Stand	77 50	
			888 00
Sept. 20	Receipts of Grand Stand	$74 00	
Sept. 21	Receipts of Grand Stand	154 50	
Sept. 22	Receipts of Grand Stand	424 50	
Sept. 23	Receipts of Grand Stand	388 00	
Sept. 24	Beceipts of Grand Stand	262 00	
Sept. 25	Receipts of Grand Stand	253 00	
			1,556 00
Sept. 20	Hack badges	$4 00	
Sept. 24	Hack badges	4 00	
			8 00
	Robert Allen, rent of Park (10 months), to Dec. 1, 1880		2,000 00
	Race entrance fee, No. 1	$165 00	
	Race entrance fee, No. 2	175 00	
	Race entrance fee, No. 3	230 00	
	Race entrance fee, No. 4	90 00	
	Race entrance fee, No. 5	125 00	
	Race entrance fee, No. 6	300 00	
	Race entrance fee, No. 7	275 00	1,360 00
	Amounts carried forward		$22,926 94

Receipts—Continued.

Date.	From what Source.	Amounts.	Totals.
	Amounts brought forward		$22,926 94
	Race entrance fee, No. 8	840 00	
	Race entrance fee, No. 9	150 00	
	Race entrance fee, No. 10	720 00	
	Race entrance fee, No. 11	785 00	
	Race entrance fee, No. 12	275 00	
	Race entrance fee, No. 13	225 00	
	Race entrance fee, No. 15	275 00	
	Race entrance fee, No. 16	720 00	
	Race entrance fee, No. 17	400 00	
	Race entrance fee, No. 18	108 00	
	Race entrance fee, No. 19	200 00	
	Race entrance fee, No. 20	115 00	
	Race entrance fee, No. 21	550 00	
	Race entrance fee, No. 22	450 00	
			7,173 00
	W. F. Peterson, part payment on restaurant privilege		15 00
	Killip & Co., pool privilege		1,500 00
	Martin & Kroll, pop-corn privilege		20 00
	State warrant		4,500 00
	C. Deaves, diorama privilege		40 00
	O. S. Larame, cider privilege		50 00
	Overdraft at D. O. Mills & Co.		4,200 00
	Society's pro rata of pool profits		913 75
	J. E. Larue, entrance money on sweepstakes		92 50
	Sacramento County, for repairs to Pavilion		160 40
	Sale of Art Catalogues		41 00
	Wm. Schaumloeffel, bar privilege		100 00
	Mrs. J. R. Hayes, balance on restaurant privilege		100 00
	Total		$40,472 59

EXPENDITURES.

PAVILION PAY-ROLL.

Date.	For What Purpose.	Amounts.	Totals.
	Will J. Beatty, Assistant Secretary	$100 00	
	John Bellmer, Financial Clerk	75 00	
	O. P. Dodge, Assistant Superintendent	99 50	
	Tom L. Stovall, Entry Clerk, Third Department	60 00	
	H. O. White, Entry Clerk, Fourth Department	55 00	
	J. E. Hobby, Chief Ticket Clerk	30 00	
	Lopez Mauldin, Assistant Ticket Clerk	18 00	
	Eugene Bush, Messenger	12 00	
	Will J. Craig, Messenger	34 00	
	Aaron Powers, Messenger	16 00	
	Eugene LaRue, counting tickets	21 00	
	W. H. Luther, Doorkeeper	27 00	
	Jno. Leadley, Doorkeeper	30 00	
	Abe. Keithley, Doorkeeper	30 00	
	J. H. Cooper, chief carpenter	111 50	
	Geo. Williams, carpenter	96 00	
	Chas. Sexton, carpenter	84 00	
	Chas. Ott, carpenter	63 00	
	S. A. Waine, carpenter	6 00	
	S. S. Parker, carpenter	10 00	
	Chas. Perry, painter	50 00	
	Geo. Burchard, painter	40 00	
	A. Cowager, machinist	5 25	
	Robert Harrison, watchman	33 00	$1,107 25
	Amounts carried forward		$1,107 25

Expenditures—Continued.

Date.	For what Purpose.	Amounts.	Totals.
	Amounts brought forward		$1,107 25
	Mike O'Mera, watchman	30 00	
	Seth Wilson, watchman	27 00	
	Jno. A. Stanton, laborer	10 00	
	Hugh Jeffries, laborer	52 50	
	Frank Jackson, laborer	33 75	
	R. Van Olinda, laborer	72 50	
	William Burchard, laborer	62 50	
	J. H. Hart, laborer	40 00	
	Fred. Sackett, laborer	36 25	
	Ed. Harris, laborer	37 50	
	William Johnson, laborer	81 00	
	E. Parsons, laborer	32 50	
	Chas. Hoag, laborer	36 25	
	Hiram Clock, laborer	77 50	
	Joseph Graham, laborer	18 00	
	Jno. Fitzpatrick, laborer	6 00	
	S. R. Thomas, laborer	10 00	
	W. R. Brown, laborer	10 00	
	D. Bloom, laborer	10 00	
	A. Johnson, laborer	15 00	
	Geo. T. Williams, laborer	20 00	
	E. J. McIntyre, laborer	10 00	
	T. J. Corrigan, decorator	10 00	
	Charlotte Johnson, ladies' maid	12 00	
	J. R. Martin, Superintendent Art Department	100 00	910 15
	Total		$1,956 50
	PARK PAY ROLL.		
	George W. Gilbert, Clerk of Course	$50 00	
	Ed. F. Smith, Chief Ticket Clerk	30 00	
	H. Moore, Assistant Ticket Clerk	18 00	
	O. C. Flint, Assistant Ticket Clerk	18 00	
	A. F. Raymond, Season Ticket Clerk	30 00	
	A. M. Seymore, Assistant Season Ticket Clerk	18 00	
	Eugene LaRue, Entry Clerk, First Department	45 00	
	T. J. Swayne, Entry Clerk, Second Department	45 00	
	Kent Seymore, ticket seller	12 00	
	Will J. Craig, ticket seller	12 00	
	Howard Bassett, ticket seller	12 00	
	Geo. Ingalls, ticket seller	8 00	
	Andrew George, ticket seller	8 00	
	J. P. Shellers, gate man	30 00	
	Hiram Garrett, gate man	30 00	
	T. H. Russell, gate man	30 00	
	Joel Smith, gate man	30 00	
	J. Henderson, gate man	15 00	
	N. J. Tolls, gate man	18 00	
	John Spillman, gate man	24 00	
	A. T. Renwick, gate man	15 00	
	Jas. McCleary, gate man	15 00	
	D. S. Jackson, gate man	15 00	
	R. B. Robertson, gate man	15 00	
	A. J. Biglow, gate man	18 00	
	Geo. Ingalls, gate man	10 00	
	T. P. Smith, gate man	12 50	
	Tom Anderson, gate man	15 00	
	P. J. Brogan, gate man	6 25	
	P. Lynch, gate man	1 25	
	R. May, rope man	15 00	
	Anthony Green, rope man	15 00	
	O. H. Wing, rope man	15 00	
	C. A. Pearson, rope man	7 50	$658 50
	Amounts carried forward		$658 50

EXPENDITURES—Continued.

Date.	FOR WHAT PURPOSE.	Amounts.	Totals.
	Amounts brought forward		$658 50
	R. Lowell, rope man	10 00	
	P. L. Hickman, stair man	12 00	
	Wm. Bently, stair man	12 00	
	Lee LaRue, stair man	12 00	
	James T. Doody, stair man	18 00	
	B. F. Ready, stair man	12 00	
	Frank Knox, stair man	12 00	
	L. Rider, stair man	12 00	
	Cyrus Newton, stair man	12 00	
	E. Deitz, stair man	12 00	
	T. R. Porter, stair man	10 00	
	Get. Woodburn, stair man	12 00	
	Ben. Chambers, police	12 50	
	W. H. McCarty, police, east turn	10 00	
	R. McGrath, police, east wall	10 00	
	Jas. Anderson, police	16 00	
	M. O'Mera, Jr., police	21 00	
	S. B. Smart, police	18 00	
	L. H. Griggs, police	10 00	
	Austin Reed, police	10 00	
	D. N. Walker, police	18 00	
	F. T. Phillips, police	15 00	
	John Cady, police, east wall	15 00	
	W. C. Granger, police, west wall	15 00	
	C. W. Tappin, night watchman	24 00	
	Henry Garrett, Judges' stand	15 00	
	V. Richardson, laborer	4 75	
	Geo. Eldridge, laborer	4 50	
	W. Leanord, laborer	2 00	
	James Connell, laborer	30 00	
	C. Mechams, laborer	27 00	
	Joseph Campbell, porter Judges' stand	18 00	
	W. Smith, watchman	12 00	
	Irving Seymore, clerk of blackboard	15 00	
	John Doe, laborer	3 00	
	B. F. Stewart, Marshal	30 00	
	L. Todhunter, Marshal	30 00	
	H. S. Beals, usher special stand	18 00	
	W. Singleton, porter	15 00	
	Sam. Blair	24 00	
	T. Bohman	2 50	
	J. L. Clark	45 00	
	Chas. Pearson, laborer	20 00	
	P. C. Fenner, laborer	1 00	657 25
	Total		$1,315 75
	PREMIUMS AT PARK.		
	D. McCarty	$70 00	
	E. L. Aiken	60 00	
	T. J. Hutchinson	40 00	
	C. Younger	437 50	
	P. Stanton	20 00	
	Geo. L. Culberson	40 00	
	G. W. Carey	20 00	
	John Pfau	20 00	
	R. Noell	70 00	
	Henry Pierce	120 00	
	Geo. Bement	190 00	
	F. W. Covey	165 00	
	T. D. Morris	100 00	
	Ben. E. Harris	65 00	
	J. Askew	30 00	$1,447 50
	Amounts carried forward		$1,447 50

EXPENDITURES—Continued.

Date.	FOR WHAT PURPOSE.	Amounts.	Totals.
	Amounts brought forward		$1,447 50
	William Sparrow	20 00	
	R. Ashburner	100 00	
	Robt. Beck	40 00	
	T. Waite	5 00	
	R. J. Merkley	65 00	
	Gen. Sewell	40 00	
	J. P. Odbert	30 00	
	M. D. Boruck	15 00	
	Gen. Jno. Bidwell	40 00	
	Mrs. R. Blacow	222 50	
	E. Comstock	195 00	
	C. Clark	40 00	
	Edward Stokes	20 00	
	L. N. Scott	30 00	
	Elias Gallup	120 00	
	W. L. Pritchard	185 00	
	William Baudeen	10 00	
	J. S. Harris	235 00	
	Hugh Cove	30 00	
	M. Wick	70 00	
	E. W. Woolsey	105 00	
	J. H. Strowbridge	67 50	
	J. D. Carr	120 00	
	M. W. Hicks	40 00	
	H. Hellwegan	2 00	
	Larkin & Co.	55 00	
	Theo. Winters	175 00	
	J. B. McDonald	10 00	
	C. W. Rapp	5 00	
	F. S. George	5 00	
	F. A. Kelley	10 00	
	L. E. McMahon	15 00	
	Geo. Bement, premium on barley, 1879	10 00	
	H. Brightman	10 00	
	P. J. O'Brien	10 00	
	J. H. Burkes	10 00	
	John Rider	195 00	
	Baker & Hamilton	160 00	
	Rose & King	10 00	
	J. F. Hill	10 00	
	A. Meister	10 00	
	E. S. Hart	5 00	
	J. Klees & Co.	5 00	
	W. Gutenburger	10 00	
	Rusby & Merry	10 00	
	M. C. Hawley & Co.	10 00	
	M. R. Rose	50 00	
	Miss Ella Mouton, ladies' equestrian match	55 00	2,692 00
	Total		$4,139 50
	PREMIUMS AT PAVILION.		
	J. R. Martin	$435 00	
	Norton Bush	36 00	
	Vanderslice & Co.	25 00	
	I. S. Bamber	18 00	
	Pacific Spring and Mattress Co.	35 00	
	Eugenia Excoffier	3 00	
	Minnie B. Cross	3 00	
	W. T. Jackson	15 00	
	Sherman, Hyde & Co.	20 00	
	Mrs. A. J. Perry	3 00	
	R. S. Lockett	28 00	$621 00
	Amounts carried forward		$621 00

EXPENDITURES—Continued.

Date.	For what Purpose.	Amounts.	Totals.
	Amounts brought forward		$621 00
	Brighton Distillery Co.	15 00	
	F. P. Lowell	10 00	
	Miss Alice Parker	10 00	
	D. McGregor	3 00	
	Mrs. H. H. Pierson	11 00	
	Mrs. M. A. Morehead	5 00	
	Mrs. C. Hahn	5 00	
	Mrs. B. F. Tade	5 00	
	Mrs. Kitty Walthers	5 00	
	Mrs. E. F. Aiken	10 00	
	G. T. Bascom	18 00	
	Cooke & Son	25 00	
	Miss Nettie Montfort	28 00	
	Thos. O'Brien	10 00	
	W. H. Lowell	10 00	
	Mrs. Mary Miller	5 00	
	F. Flohr	9 00	
	Aaron Powers	3 00	
	John Utschig	20 00	
	J. R. Hodson	15 00	
	George H. Fuller	10 00	
	Haywood & Co.	5 00	
	Mrs. E. C. Bingay	3 00	
	Miss Amelia Keipple	3 00	
	Mrs. L. H. Wells	3 00	
	T. P. M. Fenn	2 50	
	W. R. Freeman	6 00	
	Mrs. J. N. Porter	10 00	
	Mrs. W. A. Houghton	3 00	
	B. F. Farrar	5 00	
	F. Lunderman	10 00	
	Misses Brothers	40 00	
	Mrs. William Bassett	20 00	
	James Parsons	9 00	
	Miss Mattie Hunt	5 00	
	W. F. Hicks	7 00	
	Miss Belle Felter	43 00	
	A. B. Gilbert	5 00	
	Miss Flora Carroll	6 00	
	Main & Winchester	35 00	
	Mrs. R. O. Cravens	5 00	
	Miss Anna Benedict	5 00	
	Billingsly & Co.	58 00	
	Scott & Muir	10 00	
	George Spiker	20 00	
	Mrs. G. Marks	10 00	
	George W. Shreve	28 00	
	Terrence Duffy	15 00	
	H. A. Dickinson	3 00	
	W. F. Peterson	13 00	
	Phil. Brusie	41 00	
	Mrs. Julia Ostrom	6 00	
	Capital Woolen Mills	65 00	
	S. Tryon	50 00	
	A. L. Tryon	3 00	
	Mrs. A. L. Hoyle	5 00	
	Mrs. E. B. Hunt	8 00	
	Dale & Co.	10 00	
	Mrs. R. Lawrie	38 00	
	M. C. Buges	5 00	
	S. J. Nathan & Co.	10 00	
	Aitken & Fish	3 00	
	Edward Kraus	5 00	
	Williamson & Co.	60 00	928 00
	Amounts carried forward		$1,549 00

Expenditures—Continued.

Date.	For what Purpose.	Amounts.	Totals.
	Amounts brought forward		$1,549 00
	T. H. Lewis	6 00	
	F. A. Ebel	45 00	
	James Rutter	30 00	
	Frank Kunz	40 00	
	George Duden	5 00	
	Felice Gabrielli	73 00	
	Mrs. H. H. Smith	5 00	
	Ida Elkus	3 00	
	Eugene Elkus	3 00	
	N. B. Gilbert	5 00	
	William Eberhardt	5 00	
	Mrs. E. Katzenstein	15 00	
	Mrs. J. Bisaillion	5 00	
	P. H. Murphy	30 00	
	Clara A. Murphy	2 00	
	L. L. Lewis & Co.	50 00	
	Whittier, Fuller & Co	35 00	
	Hobby & Smith	8 00	
	Johnson Brandy and Wine Manufacturing Co.	45 00	
	Gen. John Bidwell	70 00	
	J. G. Davis	10 00	
	W. J. Straight	9 00	
	George T. Bush	30 00	
	John Breuner	100 00	
	Mrs. T. L. Acock	5 00	
	Mrs. E. S. Hart	15 00	
	Mrs. H. Cronkite	85 00	
	H. C. Megerlie	3 00	
	Locke & Lavenson	20 00	
	F. Babel	2 00	
	Mrs. P. J. Quick	3 00	
	Flora Weeks	3 00	
	Mrs. M. A. Hunter	5 00	
	Mrs. N. D. Goodell	3 00	
	M. Jewell	10 00	
	Lipman & Co.	20 00	
	Miss McCormick	3 00	
	B. B. Scott & Son	2 00	
	F. C. Neal	5 00	813 50
	Total		$2,362 50
	GENERAL DISBURSEMENTS.		
Jan. 21	I. N. Hoag, salary for November, 1879	$100 00	
Feb. 5	I. N. Hoag, salary on December, 1879	80 00	
Feb. 10	Robert Allen, repairs at Park	81 85	
Feb. 10	I. N. Hoag, salary on December, 1879, and Jan., 1880	118 15	
Mar. 11	Capital Gas Company, gas bill	11 90	
Mar. 11	I. N. Hoag, salary to March 1st, 1880	101 85	
Mar. 13	James Connell, labor at Park	11 00	
Mar. 18	C. A. Pearson, labor at Park	6 00	
Mar. 26	Wachhorst, silverware	15 00	
April 9	D. Gardner, wood	4 50	
April 10	I. N. Hoag, salary to April 1st, 1880	100 29	
April 23	G. W. Hancock, expenses	29 00	
April 23	W. C. Hopping, Post Office box rent and stamps	20 00	
May 4	Capital Gas Company, gas bill	1 75	
May 12	Daily Bee, advertising	3 50	
May 12	I. N. Hoag, salary for April	100 00	
May 15	D. Gardner & Co., wood	4 50	
June 11	I. N. Hoag, salary for May, 1880	100 00	
June 11	W. C. Hopping, postage stamps	50 00	
June 28	Hiram Clock, labor at Pavilion	11 00	860 29
	Amounts carried forward		$860 29

Expenditures—Continued.

Date.	For what Purpose.	Amounts.	Totals.
	Amounts brought forward		$860 29
June 28	James Connell, labor at Pavilion	$10 00	
July 3	D. M. Burns, Commissioner's fee	60 00	
July 3	I. N. Hoag, salary for June	100 00	
July 3	I. N. Hoag, expenses	23 70	
July 8	A. Leonard, insurance premium	93 70	
July 9	John T. Carey, insurance premium	93 75	
July 9	H. Hanche, insurance premium	62 50	
July 9	W. C. Hopping, postage stamps	26 30	
July 9	D. O. Mills & Co., interest on $5,500 overdraft	278 43	
July 9	W. C. Hopping, Post Office box rent and postage	20 20	
July 24	I. N. Hoag, salary for July, 1880	100 00	
Aug. 9	P. Goodwin, forfeits returned	65 00	
Aug. 13	D. O. Mills & Co., Directors' note and interest	5,156 94	
Aug. 16	George L. Lytle, Annual Cyclopedia	6 00	
Aug. 16	George Howson, forfeits returned	55 00	
Aug. 23	W. P. Coleman, old warrant	515 38	
Aug. 24	Levinson Bros., for Vanderslice & Co.	632 18	
Aug. 24	I. N. Hoag, salary for August, 1880	100 00	
Aug. 27	Hiram Clock, labor at Pavilion	15 00	
Aug. 27	R. J. Merkley, entrance fee returned	60 00	
Aug. 28	W. C. Hopping, postage stamps and envelopes	51 20	
Sept. 10	H. S. Crocker & Co., stationery and printing	682 36	
Sept. 10	George Lasmer, labor at Pavilion	25 00	
Sept. 16	I. N. Hoag, salary for September	100 00	
----------	C. H. Shear, stalls (for Killip)	15 00	
Sept. 26	J. R. Martin, molding	1 00	
Sept. 26	F. W. Covey, Capt. Smith, stake 79	117 50	
Sept. 26	I. Fetterby, cartage	6 00	
Sept. 27	John Toomey, hack hire	15 00	
Sept. 27	Record Union, on account, advertising	50 00	
Sept. 27	Church & Jones, music	490 00	
Sept. 27	Thos. O'Brien, decorating fountain	15 00	
Sept. 27	Jesse Slaughter, whitewashing Park	192 00	
Sept. 27	R. S. Jones, chest for tickets	6 50	
Sept. 27	Moses Sprague, oat hay	563 44	
Sept. 27	M. Barber, grain	37 60	
Sept. 27	Carter Jackson, sand	7 50	
Sept. 27	W. F. Peterson, lunch for President Hayes and party	62 50	
Sept. 27	Ben. F. Pike & Co., carpentering at Park	183 24	
Sept. 27	R. H. Pettit, cigars, Judges' stand	4 35	
Sept. 27	H. O. White, painting blackboard	9 50	
Sept. 27	Geo. Boyne, decorating	85 00	
Sept. 27	Grangers' Store, sundries	117 95	
Sept. 27	Will J. Beatty, freight and expressage	2 25	
Sept. 27	W. P. Coleman, bill for ribbon	2 50	
Sept. 27	T. C. May, freight and cartage	8 70	
Sept. 27	Samuel Gale, whitewashing at Pavilion	58 00	
Sept. 27	M. Barber, feed	1 00	
Sept. 27	Jesse Slaughter, whitewashing at Park	13 00	
Sept. 27	Williamson & Co., poplar trees	8 40	
Sept. 27	H. A. Wade, soap	8 00	
Sept. 27	James Connell, labor and contract	70 00	
Sept. 27	Scott & Muir, work at Park	61 40	
Sept. 27	Scott & Muir, work at Pavilion	10 00	
Sept. 27	Michael Keefe, straw	264 60	
Sept. 27	M. D. Boruck, advertising	205 00	
Sept. 27	Record Union, advertising balance	48 00	
Sept. 27	L. L. Lewis & Co., chimney tops, at Park	13 50	
Sept. 27	C. Schindler, blackboard for park	6 88	
Sept. 27	Whittier, Fuller & Co., glass and glazing	88 00	
Sept. 27	M. C. Hopping, Post Office box rent	4 00	
Sept. 27	W. A. Caswell, bill posting	31 00	
Sept. 27	Sacramento Transfer Company, expressage at Park	3 50	
Oct. 1	J. A. Lafferty, expressage	33 00	11,253 45
	Amounts carried forward		$12,113 74

Expenditures—Continued.

Date.	For what Purpose.	Amounts.	Totals.
	Amounts brought forward		$12,113 74
Oct. 2	Robt. Hellman, expressage	$5 00	
Oct. 2	D. W. Booth, expressage	1 00	
Oct. 2	Dale & Co., fringe and stars for badges, etc.	6 38	
Oct. 2	J. F. Slater, caps for jockeys	24 00	
Oct. 2	Baker & Hamilton, hardware	3 05	
Oct. 2	R. Stone & Co., side saddle	20 00	
Oct. 2	T. D. Scriver, horse for Grand Marshal	30 00	
Oct. 2	Stockton Independent, advertising	3 50	
Oct. 2	San José Mercury, advertising	2 50	
Oct. 2	Rural Press, advertising	1 25	
Oct. 2	San Francisco Chronicle, advertising	5 50	
Oct. 2	Pacific Life, advertising	3 00	
Oct. 2	Mechanics' School, machine work	2 40	
Oct. 2	Robt. Mellon, expressage	4 00	
Oct. 2	B. A. Johnson, provisions and cooking at Park	83 75	
Oct. 4	E. Spurgeon, hack hire	5 00	
Oct. 4	S. J. Nathan & Co., jackets for jockeys, etc.	57 50	
Oct. 4	Jesse Slaughter, whitewashing at Park	6 00	
Oct. 6	A. Hathaway, beating office carpet	5 04	
Oct. 6	Parsons, Kilgour & Co., drygoods	47 40	
Oct. 6	J. McCabe, expressage	4 00	
Oct. 9	Wells, Fargo & Co., freight on book	2 60	
Oct. 9	J. L. Clark, twenty loads of sediment	15 00	
Oct. 9	E. Lesser, glazing	3 00	
Oct. 9	F. Henley, cleaning flue at Pavilion	2 50	
Oct. 11	W. P. Coleman, insurance premium	24 00	
Oct. 11	Tom L. Stovall, clerical work (two days)	6 00	
Oct. 12	M. K. Vanderslice & Co., silverware for premiums	702 00	
Oct. 12	Mrs. Blackleach, making badges	13 00	
Oct. 13	Daily Bee, advertising	39 00	
Oct. 13	E. Grubbs, hauling chairs to Park	5 00	
Oct. 13	Scott & Muir, gasfitting at Pavilion	206 50	
Oct. 13	King & Rose, laying pipe at Park	20 20	
Oct. 15	M. R. Rose, use of engine, etc., at Park	184 75	
Oct. 15	Carle & Croly, lumber work, etc.	59 68	
Oct. 15	Holman, Stanton & Co., hasps and staples	2 95	
Oct. 15	Lipman & Co., ribbon	30 00	
Oct. 15	Miss P. J. Quick, flowers for office	1 50	
Oct. 15	James Parsons, empty cases	2 25	
Oct. 15	H. H. McWilliams	19 25	
Oct. 15	Hamburger & Co., ribbon for premiums	26 00	
Oct. 15	Assessment National Trotting Association	75 40	
Oct. 15	I. N. Hoag, salary for October, 1880	100 00	
Oct. 19	Sacramento Lumber Company, lumber	139 71	
Nov. 6	Geo. T. Bush, plumbing at Park	75 68	
Nov. 6	A. Henley, brickwork at Park	2 50	
Nov. 6	I. N. Hoag, expenses	36 90	
Nov. 6	J. F. Hill, repairing implements at Park	68 05	
Nov. 6	Locke & Lavenson, oilcloth, etc.	150 97	
Nov. 6	Whittier, Fuller & Co., glass, glazing, etc.	123 58	
Nov. 6	John Breuner, rent of furniture	33 95	
Nov. 6	Billingsly & Co., brooms	3 00	
Nov. 6	H. C. Kirk & Co., sundries	6 70	
Nov. 6	Sacramento Gas Company, gas bill	317 80	
Nov. 6	Pacific Ice Company, ice	5 80	
Nov. 6	John F. Cooper, flags	8 00	
Nov. 6	H. C. Krebs & Co., paints, oils, and brushes	193 96	
Nov. 6	M. S. Hammer, soap	1 75	
Nov. 6	Huntington, Hopkins & Co., hardware	83 12	
Nov. 6	A. Dennery & Co., crockery	20 75	
Nov. 6	Frank Foster, lettering badges	4 20	
Nov. 6	Holbrook, Merrill & Stetson	2 00	
Nov. 6	Jas. McGuire, blacksmithing	6 00	
Nov. 6	Jackson Bros., repairing lantern	25	3,234 23
	Amounts carried forward		$15,347 97

Expenditures—Continued.

Date.	For what Purpose.	Amounts.	Totals.
	Amounts brought forward		$15,347 97
Nov. 6	C. Muller, microscopes	$60 00	
Nov. 6	L. Kellogg, making weight for scales	50	
Nov. 6	C. H. Shear, stalls (for Martin)	15 00	
Nov. 6	Samuel Jelly, engraving gold medals	15 00	
Nov. 6	Ross & Bauer, rent of chairs	37 14	
Nov. 6	John F. Toomey, hack hire	5 00	
Nov. 6	W. P. Coleman, bill for sundries	21 00	
Nov. 6	Robt. Allen, sprinkling race course	34 00	
Nov. 6	J. W. Knox, forfeit returned	25 00	
Nov. 6	I. N. Hoag, salary for November, 1880	100 00	
Nov. 6	W. R. Strong, cleaning chimney at Pavilion	2 00	
Nov. 6	Geo. P. Wentworth, labor at Park	15 00	
Nov. 6	Error in J. Bellmer's statement	28 85	358 49
	Total		$15,706 46

Expenditures—Continued.

Date.	Purses Paid.	Amounts.	Totals.
	Race No. 1—		
	W. H. Coombs, first money	$265 00	
	D. S. Terry, second money	50 00	$315 00
	Race No. 2—		
	E. J. Baldwin, first money	250 00	
	George Howson, second money	50 00	
	W. L. Pritchard, third money	25 00	325 00
	Race No. 3—		
	W. L. Pritchard, first money	355 00	
	L. M. Darling, second money	75 00	
	P. J. Shafter, third money	50 00	480 00
	Race No. 4—		
	E. J. Baldwin, first money	315 00	
	Theodore Winters, second money	75 00	390 00
	Race No. 5—		
	P. J. Shafter, first money	250 00	
	L. M. Darling, second money	50 00	
	P. M. Chatterton, third money	25 00	325 00
	Race No. 6—		
	W. H. Cade, first money	400 00	
	George Vignola, second money	133 33	
	S. Sperry, third money	66 67	600 00
	Race No. 7—		
	L. J. Rose, first money	393 75	
	Leland Stanford, second money	131 25	525 00
	Race No. 8—		
	D. J. Green, first money	666 66	
	B. Timmons, second money	222 24	
	D. J. Green, third money	111 10	1,000 00
	Race No. 9—		
	J. C. Newton, first money	555 00	
	L. H. Titus, second money	277 50	
	L. J. Rose, third money	92 50	925 00
	Race No. 10—		
	Leland Stanford, first money	800 00	
	M. Salisbury, second money	266 67	
	L. H. Titus, third money	133 33	1,200 00
	Race No. 11—		
	S. Crandell, first money	716 66	
	W. Smith, second money	238 88	
	J. C. Newton, third money	119 46	1,075 00
	Amounts carried forward		$7,160 00

EXPENDITURES—Continued.

Date.	PURSES PAID.	Amounts.	Totals.
	Amounts brought forward		$7,160 00
	Race No. 12—		
	J. B. McDonald, first money	$383 34	
	M. Salisbury, second money	191 66	575 00
	Race No. 13—		
	Theodore Winters, first money	400 00	
	W. L. Pritchard, second money	50 00	
	Theodore Winters, third money	25 00	475 00
	Race No. 14—		
	Theodore Winters, first money	150 00	
	George Howson, second money	50 00	200 00
	Race No. 15—		
	L. R. Martin, first money	550 00	
	Theodore Winters, second money	150 00	
	L. R. Martin, third money	75 00	775 00
	Race No. 16—		
	S. K. Whipple, first money	800 00	
	Robert Beck, second money	200 66	
	S. K. Whipple, third money	133 34	1,200 00
	Race No. 17—		
	D. J. Green, first money	666 66	
	G. Valensia, second money	222 23	
	James Price, third money	111 11	1,000 00
	Race No. 18—		
	F. W. Covey, first money	240 00	
	L. J. Rose, second money	80 00	
	F. W. Covey, third money	40 00	360 00
	Race No. 19—		
	P. A. Finigan, first money	1,000 00	1,000 00
	Race No. 20—		
	L. M. Darling, first money	190 00	
	Theodore Winters, second money	25 00	215 00
	Race No. 21—		
	P. M. Chatterton, first money	725 00	
	P. J. Shafter, second money	100 00	
	L. M. Darling, third money	50 00	875 00
	Race No. 22—		
	L. M. Martin, first money	750 00	
	Theodore Winters, second money	200 00	
	L. M. Martin, third money	100 00	1,050 00
	Total		$14,885 00

SUMMARY.

Dr.			Cr.
To balance January, 1880	$1 94	By Pavilion pay-roll	$1,956 50
Annual memberships	6,532 50	By Park pay-roll	1,315 75
Life memberships	50 00	By premiums at Park	4,139 50
Single admissions	10,133 00	By premiums at Pavilion	2,362 50
Quarter stretch badges	397 50	Miscellaneous	15,677 21
Special stand	888 00	By error in balance account	28 85
Grand stand	1,556 00	By purses paid	14,885 00
Hack badges	8 00	By balance	107 28
Robert Allen	2,000 00		
Entrance fees to races	7,173 00		
Restaurant privilege	115 00		
Killip & Co., pool privilege	1,500 00		
Popcorn privilege	20 00		
State warrant	4,500 00		
Diorama privilege	40 00		
Cider privilege	50 00		
Overdraft	4,200 00		
Pro rata pool profits	913 75		
Entrance on sweepstakes	92 50		
Sacramento County, Pavilion repairs	160 40		
Catalogues	41 00		
Bar privilege	100 00		
	$40,472 59		$40,472 59
Nov. 15, To balance	$107 28		

EXHIBITS AT THE FAIR—1880.

ANIMALS EXHIBITED AT THE PARK.

FIRST DEPARTMENT.

CLASS I.—THOROUGHBRED HORSES

Color.	Name.	Sire.	Dam.	Owner.	Residence.
STALLIONS.					
Two Years Old.					
	Clifton Belle	Leinster	Tibbie Dunbar	W. L. Pritchard	Sacramento.
One Year Old.					
Chestnut	Conquest	Lever	Cuba	L. Stanford	San Francisco.
Bay	Sam. Boring	Wildidle	Mary Watson	Charles Murphy	San José.
Bay	"305"	Norfolk	Addie C.	Theo. Winters	Winters, Yolo Co.
Bay	No name	Leinster	Ireno Harding	W. L. Pritchard	Sacramento.
Bay	No name	Leinster	Tibbie Dunbar	W. L. Pritchard	Sacramento.
Colts Under One Year Old.					
Bay	No name	Norfolk	Addie C.	Theodore Winters	Winters, Yolo Co.
Chestnut	No name	Bazaar	By Lexington	W. L. Pritchard	Sacramento.
Chestnut	No name	Leinster	Tibbie Dunbar	W. L. Pritchard	Sacramento.
Chestnut	No name	Bazaar	By Lienster	W. L. Pritchard	Sacramonto.
MARES.					
Four Years Old and Over, with Colt.					
Bay	Mary Watson and colt	Imported Hercules	By Independence	Charles Murphy	San José.
Chestnut	Mattie A. and colt	Imported Australian	Minnie Mansfield	Theodore Winters	Winters, Yolo Co.
Bay	Addie C. and colt	Revenue	Sallie Morgan	Theodore Winters	Winters, Yolo Co.
	Tibbie Dunbar and colt	Imported Bonnie Scott	By imp. Knight of St. George	W. L. Pritchard	Sacramento.
	Addie A. and colt	Asteroid	By imported Sovereign	W. L. Pritchard	Sacramento.
Chestnut	Avaril and colt	Leinster	By Lightning	W. L. Pritchard	Sacramento.
	Sophia Jennison and colt	Jack Malone	By imported Glencoe	W. L. Pritchard	Sacramento.
	Vivian and colt	Lamington	By Lexington	W. L. Pritchard	Sacramento.

Four Years Old and Over.

Bay	Marion	Malcolm	Maggie Mitchell	Theodore Winters	Winters, Yolo Co.
Gray	Lexington Belle	Lexington	Eagless	J. B. McDonald	Marysville.
Bay	Demoutto	Melbourne	By Sythian	E. Denman	Petaluma.
Bay	Lady Evangeline	Leinster	By imported Bonnie Scott	W. L. Pritchard	Sacramento.

Three Years Old.

Chestnut	Rosa Lee	Leinster	By Darby	W. L. Pritchard	Sacramento.

Two Years Old.

Gray	No name	Foster or Leinster	By Newry	W. L. Pritchard	Sacramento.

One Year Old.

Black	Cornucopia	Virgil	Rivulet	L. Stanford	San Francisco.
Chestnut	Evangeline	Longfellow	Robin Girl	L. Stanford	San Francisco.
Bay	Belle Boyd	Springbok	Boydana	L. Stanford	San Francisco.
Chestnut	Fostress	Foster	Planetia	L. Stanford	San Francisco.
Bay	Duchess of Norfolk	Norfolk	Marion	Theodore Winters	Winters, Yolo Co.
Bay	Farallone	Norfolk	Golden Gate	Theodore Winters	Winters, Yolo Co.
Chestnut	Mamie Hanlon	Norfolk	Mattie A	Theodore Winters	Winters, Yolo Co.
Chestnut	No name	Leinster	By Flush Hiawatha	W. L. Pritchard	Sacramento.
Brown	No name	Leinster	By Rifleman	W. L. Pritchard	Sacramento.
Bay	No name	Leinster	By Asteroid	W. L. Pritchard	Sacramento.

Mare Colt Under One Year.

Brown	Brown Kitty	Bob Woodin	Mary Watson	Charles Murphy	San José.
Chestnut	No name	Norfolk	Mattie A	Theodore Winters	Winters, Yolo Co.
Chestnut	No name	Bazaar	By Jack Malone	W. L. Pritchard	Sacramento.
Bay	No name	Leinster	Asteroid	W. L. Pritchard	Sacramento.

FAMILIES.

Sire with Five Colts, all Thoroughbreds.

Chestnut	Leinster and five colts	Australian	By Lexington	W. L. Pritchard	Sacramento.

Dam with not less than Two of her Colts, all Thoroughbreds.

Bay	Mary Watson and two colts	Imported Hercules	By Independence	Charles Murphy	San José.
Bay	Sam. Boring (colt)	Wildidle	Mary Watson	Charles Murphy	San José.
Brown	Brown Kitty (colt)	Bob Woodin	Mary Watson	Charles Murphy	San José.
Chestnut	Mattie A and two colts	Imported Australian	Minnie Mansfield	Theodore Winters	Winters, Yolo Co.
Bay	Addie C and three colts	Revenue	Sallie Morgan	Theodore Winters	Winters, Yolo Co.
Bay	Tibbie Dunbar and colts	Imported Bonnie Scotland	By Knight of St. George	W. L. Pritchard	Sacramento.
Brown	Addie A and two colts	Asteroid	By imported Sovereign	W. L. Pritchard	Sacramento.

Class I—Continued.

Color.	Name.	Sire.	Dam.	Owner.	Residence.
		FAMILIES NOT THOROUGHBREDS—OPEN TO ALL.			
		Stallion, other than Thoroughbred, with not less than Five of his Colts.			
Black	Mohawk Chief and family	Rysdyke's Hambletonian	Lady Perium	L. Stanford	San Francisco.
Dapple gray	Yolo Dave and family	Normandy	By Bruner	W. O. Jennings	Blacks Station.
		FAMILIES NOT THOROUGHBREDS.			
		Dam, other than Thoroughbred, with not less than Two of her Colts.			
Bay	Lady Sylva and two colts, Emma and Agnes	Rattler	By Belmont	Ben. E. Hains	San Francisco.
Chestnut	Belle and colts	Bayard, son of Missouri Chief	By Spanker	C. Halverson	Routier Station.
	Franklin	John Bull		C. Halverson	Routier Station.
	Queen	John Bull		C. Halverson	Routier Station.
Brown	Lady Grant	Black Rolf		C. Halverson	Routier Station.
Bay	Bayswater, Jr.	Bayswater		C. Halverson	Routier Station.
Chestnut	Beautiful Belle	Bayswater		C. Halverson	Routier Station.
Bay	Poll and three colts	Argyle	By Messenger	E. Comstock	Yolo County.
Brown	Maud	Imported S. W. Wallace		E. Comstock	Yolo County.
Black	May	Imported S. W. Wallace		E. Comstock	Yolo County.
Bay	Prince	Imported S. W. Wallace		E. Comstock	Yolo County.
Bay	Kate and family	Messenger	By Black Eagle	W. O. Jennings	Blacks Station.
Black	Nettie and two colts	Imported Boulogne	By Norman Joe	R. J. Merkley	Sacramento.

CLASS II.—HORSES OF ALL WORK.

Color.	Name.	Sire.	Dam.	Owner.	Residence.
		STALLIONS.			
		Best Four Years Old and Over.			
Bay	Gen. Burton	Jim Scott, alias Jim Hambletonian	By Gray Hambletonian	L. Stanford	San Francisco.
Bay	Henry Clay	Dave Hall	By Clay	L. U. Shippee	Stockton.
Bay	Columbus	Yolo Chief	Morgan mare	J. B. Cooper	Sacramento.
	Patchen	Washington		D. McCarty	Oakland.
Bay	Capt. Bruce, Jr.	Old Robert Bruce	Belfounder mare	Miss F. C. Neal	Sacramento.
Bay	Bay Prince	Rosette Horse	Morgan mare	J. A. Polhemus	Elk Grove.
Bay	Combination	Vibrator	Hambletonian mare	T. Van Vichter	Woodbridge.
Bay	Geo. M. Patchen		A thoroughbred mare	Joel Merchant	Petaluma.
Brown	Eureka	Walnut Bark	By Laplander	John Pfau	Petaluma.
Gray	Fred. Babel	Senator	By Rattler	F. Babel	Yolo Co.
Gray	Gray Eagle	Rattler	Owen Dale mare	W. H. Neeley	Davisville.
Gray	Yolo Dave	Normandy	Bremer	W. O. Jennings	Black's Station.
Gray	Dalrymple	Yolo Dave	By Hambletonian	W. O. Jennings	Black's Station.
Chestnut	Jack Nelson	John Nelson	Flag of Truce Messinger	H. Webster	Sacramento.
Bay	Young Planter	Young Vibrator	Nancy	Andrew Naranon	Penryn.
Bay	Prince June, Jr	Prince June	Norman Mare Flora	R. J. Merkeley	Sacramento.
		Three Years Old.			
Bay	Colonel	Bellfounder	By Hambletonian	J. P. Odbert	Sacramento.
		Two Years Old.			
Steel	Tom Lawton	Norman Percheon	By Normandy	Manuel De Costa	Sacramento.
Bay	Beautonia	General Beuton	Lucetta	L. Stanford	San Francisco.
Bay	Tempest	Yolo Dave	By Messenger	W. O. Jennings	Black's Station.
Gray	Seloin	Gray Eagle	St. Clair	William Baudeen	Hicksville.
		One Year Old.			
Bay	Beneficial	General Beuton	Lucetta	L. Stanford	San Francisco.
Gray	Brigade	Brigadier	American Maid	J. B. McDonald	Marysville.
Chestnut	Grenadier	Brigadier	Lena Bowles	Ben. E. Harris	San Francisco.
Black	Sultan	Donas	Black Bess	T. Waite	Brighton.
Bay	Snap	Bay Prince	Unknown	J. A. Polhemus	Elk Grove.
Bay	Bayswater, Jr	Bayswater	Bule	C. Halverson	Routier Station.
Gray	Gray Eagle	Normandy	By Eclipse	P. H. Murphy	Brighton.
Bay	Major Kent	Nutwood	By Patchen	L. U. Shippee	Stockton.

CLASS II—Continued.

Color.	Name.	Sire.	Dam.	Owner.	Residence.
		MARES.			
		Four Years Old and Over.			
Brown	Lady Grant	Black Ralph	Belle	C. Halverson	Routier Station.
Bay	Poel	By Argyle	By Messenger	E. Comstock	Yolo Co.
Sorrel	Fancy	Yolo Dave	Bemer	W. O. Jennings	Black's Station.
Black	Lizzie	Unknown	Unknown	Peter Peters	Dixon.
Brown	Nellie	Reese River	Signal	J. B. McDonald	Marysville.
Bay	Lady Patchen	Patchen	By Joseph	L. U. Shippee	Stockton.
Bay	Hattie	Chieftain	By Messenger	L. U. Shippee	Stockton.
Sorrel	Lucy Moore and colt	George Moore Jr.	Nellie Morgan	Everitt Pierce	Sacramento.
Bay	Sallie Moore and colt	George Moore Jr.	Nellie Morgan	Everitt Pierce	Sacramento.
Gray	Annie and colt	Stanford's Nelson	Consternation	T. C. Perkins	Brighton.
Sorrel	Belle and colt	Tecumseh	Morgan mare	J. A. Polhemus	Elk Grove.
Roan	Fannie and colt	Unknown	Unknown	J. A. Polhemus	Elk Grove.
Chestnut	Belle and colt	Bayard, son of Missouri Chief	By Spanker	C. Halverson	Routier Station.
Black	Coaly and colt	Joe Nelson	By Messenger	E. Comstock	Yolo County.
Bay	Duchess and colt	G. M. Patchen Jr.	Unknown	H. S. Beals	Sacramento.
Bay	Kate and colt	Messenger	Black Eagle	W. O. Jennings	Black Station.
Brown	Belle Clark and colt	Belmont	Unknown	J. L. Clark	Sacramento.
		Three Years Old.			
Bay	Lizzie May	Eureka	Unknown	John Pfau	Petaluma.
Gray	Lady Long	Yolo Dave	Gray Eagle	W. O. Jennings	Black Station.
Black	Jane	Black Eagle	By Eclipse	P. H. Murphy	Brighton.
		Two Years Old.			
Bay	Monte Belle	Mohawk Chief	Swan	L. Stanford	San Francisco.
Sorrel	Nellie	Bay Prince	Tecumseh	J. A. Polhemus	Elk Grove.
Bay	Georgia Stegal	Black Ralph	Unknown	H. Stegal	Woodland.
		One Year Old.			
Brown	Lily	Electioneer	Lillian	L. Stanford	San Francisco.
Bay	Hattie Crocker	Electioneer	Melinche	L. Stanford	San Francisco.
Sorrel	Emma	Pinole	By Rattler	Ben. E. Harris	San Francisco.
Iron Gray	Queen	Gray Eagle	Maud	E. Comstock	Yolo County.
Bay	Lucy			C. Thodt	Dixon.

Sucking Colts.

Bay	Victoria	Leinster	Annie	T. C. Perkins	Brighton.
Sorrel	Agnes	Cardinal	Lady Siloa	Ben. E. Harris	San Francisco.
Bay	Flora	Bay Prince	Belle	J. A. Polhemus	Elk Grove.
Bay	Daisy	Bay Prince	Fannie	J. A. Polhemus	Elk Grove.
Chestnut	Beautiful Belle, two years old	Bayswater	Belle	C. Halverson	Routier Station.
Bay	Yuba Maid	Brigadier	Nellie	J. B. McDonald	Marysville.
Sorrel	Fannie	Ethan Allen	Belle Clark	J. L. Clark	Sacramento.
Bay	Nellie Bays	Bayswater	Queen	C. Halverson	Routier Station.

CLASS III.—DRAFT HORSES.

Color.	Name.	Sire.	Dam.	Owner.	Residence.
		STALLIONS.			
		Four Years Old and Over.			
Chestnut	Franklin	Old John Bull	Belle	C. Halverson	Routier Station.
Gray	Mark Dunham	By Perry's imported	Unknown	T. J. Hutchinson	Capay, Yolo Co'
Gray	French Spy	By imported horse	Unknown	A. Sackrider	Oakland.
Gray	Rockey	Pacific	By Plowboy	A. Sackrider	Oakland.
Bay	Young Tam O'Shanter	Tam O'Shanter	Unknown	A. J. Ogden	Plainfield.
Bay	Toranado	St. Lawrence	Favorite	T. Skillman	Petaluma.
		Three Years Old.			
Gray	Idol, Jr	Norman Perchon	Clysdale	Miss F. C. Neal	Sacramento.
Iron gray	Dom Pedro, Jr	Dom Pedro	Kentucky Whip	W. A. Mimmon	Dixon.
Bay	Prince	Sir Wm. Wallace, imp	Poll	E. Comstock	Yolo County.
Bay	Prince Consort, Jr	Prince Consort	By Clysdale	L. U. Shippee	Stockton.
		Two Years Old.			
Iron gray	Plowboy	Idle (Norman)	By John Bull	William Sparrow	Franklin Tp.
		One Year Old.			
Steel gray	Normandy 2d	Normandy	Nellie	R. J. Merkeley	Sacramento.
		MARES.			
		Four Years Old and Over, with Colt.			
Gray	Polly and colt	Torado	Unknown	T. Skillman	Petaluma.
Black	May and colt	Imported Sir Wm. Wallace	Poll	E. Comstock	Yolo County.
Black	Nellie	Imported Boulogne	By Norman Joe	R. J. Merkeley	Sacramento.

CLASS V—CARRIAGE HORSES.

Color.	Name.	Sire.	Dam.	Owner.	Residence.
		To be Owned and Used as Such by One Person.			
Black	Chas. F. Reed	Black Ralph	By Eagle	A. C. Bingham	Woodland.
Black	John	Bay Prince	By Eagle	A. C. Bingham	Woodland.
Black	Forest	R. E. Lee	By Lancet	J. H. Dubose	Sacramento.
Black	Buchanan	R. E. Lee	By Lancet	J. H. Dubose	Sacramento.
Bay	Lucy	Signal	By Eclipse	A. W. Gabriel & Co.	Woodland.
Bay	Kate	Signal	By Eclipse	A. W. Gabriel & Co.	Woodland.
Black	Fanny	Black Eagle	By Eclipse	P. H. Murphy	Brighton.
Black	Belle	Black Eagle	By Eclipse	P. H. Murphy	Brighton.
Brown	Nell	Unknown	Unknown	John Landers	Wheatland.
Brown	Belle	Unknown	Unknown	John Landers	Wheatland.
Bay	Jim	By Nelson	By St. Clair	D. A. Jackson	Woodland.
Bay	Doll	By St. Clair	By St. Clair	D. A. Jackson	Woodland.

CLASS VI—ROADSTER TEAMS.

Color.	Name.	Sire.	Dam.	Owner.	Residence.
		Double Teams Owned and Used as Such by One Person.			
Black	Nigger	Missouri Chief	Rattler	A. W. Royce	Yolo.
Roan	Belle	Dave Hill	Unknown	A. W. Royce	Yolo.
Gray	Mark	Taylor	Unknown	W. W. Light	Sacramento.
Gray	Luke	Taylor	Unknown	W. W. Light	Sacramento.
Sorrel	Belle	Bellfounder	By Gen. Taylor	J. W. Richmond	Sacramento.
Sorrel	Hattie	Gen. Reno	By Gen. Taylor	J. W. Richmond	Sacramento.
Black	Joe and Henry	Patchen	By Blackhawk	D. McCarty	Oakland.
Brown	Ethan Allen	Fly-by-Night	Flora	J. L. Clark	Sacramento.
Bay	H. W. Beecher	Fly-by-Night	By Bellfounder	J. L. Clark	Sacramento.

CLASS VII—SADDLE HORSES.

Color.	Name.	Sire.	Dam.	Owner.	Residence.
Bay	Trim	Bertrand	By Messenger	Wm. Baudine	Sacramento.
Ches't sorrel	Frank	Young Dave Hill	By Rattler	Geo. W. Carey	Sacramento.
Brown	White Stockings	Wagner	Gray Eagle	Ed. Stokes	San Francisco.

CLASS VIII—SWEEPSTAKES.

Color.	Name.	Sire.	Dam.	Owner.	Residence.
		STALLIONS.			
Chestnut	Bayswater	Lexington	Bay Leaf, by Yorkshire	C. Halverson	Routier Station.
Bay	Echo	Rysdick's Hambletonian	Fanny Fenton	L. H. Titus	San Gabriel.
Chestnut	Jo. Hooker	Monday	Mayflower	Theo. Winters	Winters, Yolo Co.
Bay	Signal Tehama Chief	Signal Chief	By Morgan	G. Leroux	Tehama.
		MARES.			
Chestnut	Mattie A.	Imported Australian	Minnie Mansfield	Theo. Winters	Winters, Yolo Co.
Bay	Marion	Malcom	Maggie Mitchell	Theo. Winters	Winters, Yolo Co.
Black	Nellie	Imported Boulogne	By Norman Joe	R. J. Merkeley	Sacramento.
Bay	Polly	By Argyle	By Messenger	E. Comstock	Yolo Co.
		JACKS.			
		Four Years Old and Over.			
Black	Kentucky Star	By Stevens' Imported Jack	By Napoleon	Geo. L. Culberson	Capay, Yolo Co.
Black	John Henry	By Imported Jack	Mammoth	W. A. Mimmon	Dixon.
Maltese	Golconda	Young Weston	By Great Kentucky	E. G. Lysle	Sacramento.
		Two Years Old.			
Brown	H. W. Beecher	By Mammoth	By Mammoth	G. W. Carey	Sacramento.
		MULES.			
Black	Susie	Unknown	Unknown	A. J. Ogden	Woodland.
Gray	Nan	Unknown	Unknown	A. J. Ogden	Woodland.
Bay	Span mares	Unknown	Unknown	W. L. Pritchard	Sacramento.

CLASS I—DURHAM CATTLE.

Color.	Name.	Sire.	Owner.	Residence.
		BULLS.		
		Four Years Old and Over.		
Red	Osceola	Red Cloud	John Bidwell	Chico.
Red & white	Grand Prince of Lightbourne	2d Duke of Gloucester	Robert Ashburner	Baden Station.
Red	Red Thorndale	Thorndale	C. Younger	Forest Home.
		Three Years Old.		
Red	Duke of Chico	Stonewall	John Bidwell	Chico.
Red & white	Major Butler	Orlando	M. W. Wick	Oroville.
Red	11th Duke of Gabilan	Maximilian	J. D. Carr	Gabilan.
Red	Leopard	Master Maynard	E. Comstock	Yolo County.
		Two Years Old.		
Red	Cottonwood Louan 12th	Golden Louan Duke	M. Wick	Oroville.
Red & white	Independence	6th Duke of Gabilan	J. D. Carr	Gabilan.
Red & white	Gwin Prince	Grand Prince of Lightbourne	Chas. Clark	Milpitas.
Red	Baden Duke	Kirklevington Duke 2d	Robt. Ashburner	Baden Station.
Red	2d Duke of Alameda	Master Maynard	C. Younger	Forest Home.
		One Year Old.		
Red	Oxford Beau	6th Duke of Gabilan	J. D. Carr	Gabilan.
Red & white	Chitton Prince	Grand Prince of Lightbourne	Robt. Ashburner	Baden Station.
Roan	Kirkleonigton Chief	Kirklevington	Robt. Ashburner	Baden Station.
Roan	Kirkleonigton Hero	Kirklevington	Robt. Ashburner	Baden Station.
Red	7th Red Thorndale	Red Thorndale	C. Younger	Forest Home.
Red	10th Red Thorndale	Red Thorndale	C. Younger	Forest Home.
Red	11th Red Thorndale	Red Thorndale	C. Younger	Forest Home.
Red & roan	Bullion	Duke of Manchester	D. Flint	Sacramento.
		Bull Calves.		
Red	Golden Wreath	Major Butler	M. Wick	Oroville.
Red	Garfield	Major Butler	M. Wick	Oroville.
Red	23d Duke of Gabilan	6th Duke of Gabilan	J. D. Carr	Gabilan.
Red	Milpitas Prince	Gwin Prince	Chas. Clark	Milpitas.
Red	Ruby Prince	Gwin Prince	Chas. Clark	Milpitas.

Red	Dutchy's Prince	Gwin Prince	Chas. Clark	Milpitas.
Red	Baden Duke 3d	Kirklevington Duke 2d	Robt. Ashburner	Baden Station.
Roan	Cherry Prince	Grand Prince of Lightbourne	Robt. Ashburner	Baden Station.
Red	Goldfinder	Grand Prince of Lightbourne	Robt. Ashburner	Baden Station.
Red	Baden Duke 4th	Grand Prince of Lightbourne	Robt. Ashburner	Baden Station.
Roan	15th Red Thorndale	Red Thorndale	C. Younger	Forest Home.
Roan	16th Red Thorndale	Red Thorndale	C. Younger	Forest Home.
Red	Maynard's Duke	1st Duke of Alameda	C. Younger	Forest Home.
Red	1st Duke of Brighton	Minstre Duke	P. H. Murphy	Brighton.
Red	Duke 2d	Duke Sharon	R. J. Merkley	Sacramento.
Red	Duke 3d	Duke Sharon	R. J. Merkley	Sacramento.
Red & white	(Three days' old)	By Red Thorndale	D. Flint	Sacramento.

DURHAM CATTLE—COWS.

Four years old and over.

Red	Gem	Crown Prince	M. Wick	Oroville.
Red	Venus	Red Cloud	M. Wick	Oroville.
Red	Ruby	Orlando	M. Wick	Oroville.
Red	Frantic Louan 1st	Golden Louan Duke	M. Wick	Oroville.
Roan	Pet of Geneva		J. D. Carr	Gabilan.
Red	Hope 2d		J. D. Carr	Gabilan.
Red	Portulacca		J. D. Carr	Gabilan.
Red	3d Maid of Monterey		J. D. Carr	Gabilan.
Roan	Duchess of York 15th	Sheriff	Chas. Clark	Milpitas.
Red	Duchess of York 13th	Sheriff	Chas. Clark	Milpitas.
Red	Mollie	Rudolph	Chas. Clark	Milpitas.
Red	Dolly Thorndale	Thorndale	C. Younger	Forest Home.
Roan	2d Rose of Forest Home	Thorndale	C. Younger	Forest Home.
Red	2d Belle of Avenue Ranch	Master Maynard	C. Younger	Forest Home.
Roan	1st Golden Gate	Thorndale	C. Younger	Forest Home.
Red	Miranda 14th	Monkey John	P. H. Murphy	Brighton.
Red & white	Edith Elkin	Robert Lee	R. J. Merkley	Sacramento.
Red	Ruby	Amos Ladd	R. J. Merkley	Sacramento.
Roan	Rosette 7th	Turk of Oak Home	Dan. Flint	Sacramento.

Three Years Old.

Red	Dolly 2d	Airdrie Thorndale	C. Younger	Forest Home.
Red	Jessie Maynard	Master Maynard	C. Younger	Forest Home.

CLASS I—Continued.

Color.	Name.	Sire.	Owner.	Residence.
		Two Years Old.		
Red	Frantic Louan 6th	Golden Louan Duke	M. Wick	Oroville.
Roan	Hope 27th	6th Lord Oxford	J. D. Carr	Gabilan.
Roan	Fairy Queen 4th	6th Lord Oxford	J. D. Carr	Gabilan.
Red	Gabilan Beauty	6th Lord Oxford	J. D. Carr	Gabilan.
Roan	Ruby 1st	Sheriff	Chas. Clark	Milpitas.
Roan	Red Dolly 5th	Red Thorndale	C. Younger	Forest Home.
		One Year Old.		
Red	Frantic Louan 12th	Golden Louan Duke	M. Wick	Oroville.
Red	Frantic Louan 13th	Golden Louan Duke	M. Wick	Oroville.
Red	Frantic Louan 14th	Golden Louan Duke	M. Wick	Oroville.
Red	Frantic Louan 19th	Golden Louan Duke	M. Wick	Oroville.
Roan	1st Belle of Gabilan	6th Duke of Gabilan	J. D. Carr	Gabilan.
Red & white	Fairy Queen 5th	6th Duke of Gabilan	J. D. Carr	Gabilan.
Red	18th Maid of Monterey	6th Duke of Gabilan	J. D. Carr	Gabilan.
Roan	Lady Oxford 2d	6th Duke of Gabilan	J. D. Carr	Gabilan.
Red	Ruby 4th	Sheriff	Chas. Clark	Milpitas.
Red	Duchess of York 17th	Kirklevington Duke 2d	Chas. Clark	Forest Home.
Red	6th Rose of Forest Home	Red Thorndale	C. Younger	Forest Home.
Red	6th Rosa Nell	Red Thorndale	C. Younger	Forest Home.
Red	Oxford Rose 2d	Red Thorndale	C. Younger	Forest Home.
Red	Amelia 8th	Red Thorndale	C. Younger	Forest Home.
Red	Jessie Maynard 2d	1st Duke of Alameda	C. Younger	Forest Home.
Red	4th Louan of Forest Home	1st Duke of Alameda	C. Younger	Forest Home.
Red	Edith 2d	Duke Sharon	R. J. Merkeley	Sacramento.
		Heifer Calves.		
Red	Frantic Louan 22d	Major Butler	M. Wick	Oroville.
Red	Frantic Louan 23d	Major Butler	M. Wick	Oroville.
Red	Matilda	Major Butler	M. Wick	Oroville.
Red	19th Maid of Monterey	6th Duke of Gabilan	J. D. Carr	Gabilan.
Red & white	20th Maid of Monterey	6th Duke of Gabilan	J. D. Carr	Gabilan.
Red	Red Dolly 6th	Red Thorndale	C. Younger	Forest Home.
Red	Red Dolly 7th	Red Thorndale	C. Younger	Forest Home.
Red	7th Rose of Forest Home	Red Thorndale	C. Younger	Forest Home.
Red	Oxford Rose, 3d	Red Thorndale	C. Younger	Forest Home.

ALDERNEY AND JERSEY CATTLE.—BULLS.

Four Years Old and Over.

	Buffalo Bill, Jersey	Keystone	Robert Reck	Oakland.
Gray	Paragon, Jersey	Imported	R. Noel	Grass Valley.

Three Years Old.

Solid	Hugo of Yerba Buena, Jersey	Imported Victor of Yerba Buena	H. Pierce	San Francisco.
Solid	Romeo, Jersey	Volunteer	P. Stanton	Sacramento.

Two Years Old.

	Dana Perkins	Touchstone	Robert Beck	Oakland.
Dark	Major, Jersey	Duke of Alexis	E. L. Aiken	Sacramento.
Fawn	Major, Jersey	Paragon	R. Noel	Grass Valley.

One Year Old.

	Jerome Davis	Buffalo Bill	Robert Beck	Oakland.
Solid	General Grant	Imported Paragon	J. Askew	El Dorado.
Fawn & white	Lightning Prince	Imported Paragon	R. Noel	Grass Valley.

Calves.

Dark	Bildad	Fernando	Samuel Blair	Sacramento,
Black	Bolivia	Duke Alexis	E. L. Aiken	Sacramento.
Fawn & white	Donald	Fernando	P Stanton	Sacramento.
Gray	General Grant	Paragon	R. Noel	Grass Valley.

ALDERNEY AND JERSEY COWS.

Four Years Old and Over.

	Dinah 4th	Prince of Worcester	Robert Beck	Oakland.
	Ida	Gloster	Robert Beck	Oakland.
	Murdoch Cow	Prince of Worcester	Robert Beck	Oakland.
Solid	Pearl 2d of Yerba Buena	Ralston	H. Pierce	San Francisco.
Solid	Eva of Yerba Buena	Imported from Island of Jersey	H. Pierce	San Francisco.
	Jessie	Bill Nye	E. F. Aiken	Sacramento.
Fawn & white	Creampot 5th	Emperor	P. Stanton	Sacramento.
Fawn & white	Irene of Stalsburg	Hector of Plymouth Rock	P. Stanton	Sacramento.
Fawn & white	Ione	Fernando	P. Stanton	Sacramento.
Fawn	Fannie	Imported	R. Noel	Grass Valley.
Gray	Katie	Imported	R. Noel	Grass Valley.

Class I—Continued.

Color.	Name.	Sire.	Owner.	Residence.
		Three Years Old.		
	Beauty 2d	Jarndyce	Robert Beck	Oakland.
	Ida 2d	Jarndyce	Robert Beck	Oakland.
	Lillie	Jarndyce	E. F. Aiken	Sacramento.
Solid	Cleopatra	Fernando	P. Stanton	Sacramento.
Fawn & white	Queen	Imported	R. Noel	Grass Valley.
Fawn	Topsy	Imported	R. Noel	Grass Valley.
		Two Years Old.		
	Pauline	Buffalo Bill	Robert Beck	Oakland.
	Miss Bassett	Touchstone	Robert Beck	Oakland.
	Ida 3d	Buffalo Bill	Robert Beck	Oakland.
Solid	Monplaiser of Yerba Buena	Imported from Island of Jersey	H. Pierce	San Francisco.
Solid	Fairy of Yerba Buena	Imported from Island of Jersey	H. Pierce	San Francisco.
Solid	Mignonette of Yerba Buena	Imported from Island of Jersey	H. Pierce	San Francisco.
Solid	Coquette of Yerba Buena	Imported from Island of Jersey	H. Pierce	San Francisco.
Solid	Beauty of Yerba Buena	Raunpo	H. Pierce	San Francisco.
Fawn & white	Clio	Fernando	P. Stanton	Sacramento.
		One Year Old.		
	Dinah 8th	Buffalo Bill, dam Dinah	Robert Beck	Oakland.
	Beauty 3d	Buffalo Bill, dam Beauty 2d	Robert Beck	Oakland.
	Beauty 4th	Buffalo Bill, dam Beauty 3d	Robert Beck	Oakland.
	Ida 4th	Buffalo Bill	Robert Beck	Oakland.
	Nora	Buffalo Bill, dam Ida	Robert Beck	Oakland.
Solid	Annie Carey of Yerba Buena	Imported Victor of Yerba Buena	Henry Pierce	San Francisco.
	Bertie	Romeo	P. Stanton	Sacramento.
Fawn	Jersey Belle	Surprise	J. Askew	El Dorado.
		Heifer Calves.		
	No name	Buffalo Bill	Robert Beck	Oakland.
Solid	Ida 5th	Buffalo Bill, dam Ida 2d	T. Waite	Brighton.
	Sycamore of Yerba Buena	Imported Victor of Yerba Buena	H. Pierce	San Francisco.
	Anemone	Romeo	P. Stanton	Sacramento.
Fawn	No name	Paragon	R. Noel	Grass Valley.

AYRSHIRE CATTLE—BULLS.

Three Years Old and Over.

Red & white	Melaneton Callaghan	Heber Kimball	George Bement	Redwood.
Red & white	Bobby Burns	Scotland	F. D. Morris	Sonoma.

One Year Old.

Red & white	Archie	Adonis	George Bement	Redwood.

Bull Calves.

Red & white	Eclipse	Scarborough Chief	George Bement	Redwood.

COWS.

Three Years Old and Over.

Red & white	Maggie	Imported Hiram	George Bement	Redwood.
Red & white	Stellita	Imported Hiram	George Bement	Redwood.

Two Years Old.

Red & white	Stellina	Scarborough Chief	George Bement	Redwood.

One Year Old.

Red & white	Highland Maid	Melancthon Callaghan	George Bement	Redwood.

Heifer Calves.

Red & white	Marietta	Adonis	George Bement	Redwood.

HERDS OF THOROUGHBRED CATTLE.

Over Two Years Old, to Consist of One Male and Four Females, Owned by One Person.

Solid	Buffalo Bill, Jersey	Keystone, dam Browney	Bobert Beck	Oakland.
Solid	Ida, Jersey	(See classes)	Robert Beck	Oakland.
Red & white	Dinah 11th, Jersey	(See classes)	Robert Beck	Oakland.
Solid	Beauty 2d, Jersey	(See classes)	Robert Beek	Oakland.
Solid	Ida 2d, Jersey	(See classes)	Robert Beck	Oakland.
Red	Major Butler, Durham	Orlando	M. Wick	Oroville.
Red	Gem, Durham	Crown Prince	M. Wick	Oroville.
Red	Frantic Louan 1st, Durham	Golden Louan Duke	M. Wick	Oroville.
Red	Venis, Durham	Red Cloud	M. Wick	Oroville.
Red	Ruby, Durham	Orlando	M. Wick	Oroville.
Solid	Hugo of Yerba Buena, Jersey	Imported Victor of Yerba Buena	H. Pierce	San Francisco.
Solid	Pearl of Yerba Buena, Jersey	Ralston	H. Pierce	San Francisco.
Solid	Eva of Yerba Buena, Jersey	Imported from Island of Jersey	H. Pierce	San Francisco.
Solid	Mignonette of Yerba Buena, Jersey	Imported from Island of Jersey	H. Pierce	San Francisco.
Solid	Coquette of Yerba Buena, Jersey	Imported from Island of Jersey	H. Pierce	San Francisco.
Brown & white	Melancthon Callaghan, Ayrshire	Heber Kimball	George Bement	Redwood.
Red & white	Maggie, Ayrshire	(See classes)	George Bement	Redwood.

Class I—Continued.

Color.	Name.	Sire.	Owner.	Residence.
Brown & white	Lady Chapin, Ayrshire	(See classes)	George Bement	Redwood.
Red & white	Stellita, Ayrshire	(See classes)	George Bement	Redwood.
Red & white	Stellina, Ayrshire	(See classes)	George Bement	Redwood.
Red	11th Duke of Gabilan, Durham	Maximilian	J. D. Carr	Gabilan.
Roan	Pet of Geneva, Durham	(See classes)	J. D. Carr	Gabilan.
Red	Hope 22d, Durham	(See classes)	J. D. Carr	Gabilan.
Red	Portulacca, Durham	(See classes)	J. D. Carr	Gabilan.
Red	3d Maid of Monterey, Durham	(See classes)	J. D. Carr	Gabilan.
Red	Red Thorndale, Durham	Thorndale	C. Younger	Forest Home.
Red	Dolly Thorndale, Durham	Thorndale	C. Younger	Forest Home.
Red	2d Rose, Forest Home, Durham	Thorndale	C. Younger	Forest Home.
Red	1st Golden Gate	Thorndale	C. Younger	Forest Home.
Red	Red Dolly 2d, Durham	Airdrie Thorndale	C. Younger	Forest Home.
Red & white	Royal Bill, Jersey	Touchstone, dam Dinah 5th	Robert Beck	Oakland.
Fawn	Beauty 3d, Jersey	Buffalo Bill	Robert Beck	Oakland.
Solid	Ida 4th, Jersey	Buffalo Bill	Robert Beck	Oakland.
Solid	Dinah 8th, Jersey	Buffalo Bill	Robert Beck	Oakland.
Fawn & white	Beauty 4th, Jersey	Buffalo Bill	Robert Beck	Oakland.
	Nora, Jersey	Buffalo Bill	Robert Beck	Oakland.
Red	Golden Wreath, Durham	Major Butler	M. Wick	Oroville.
Red	Frantic Louan 12th, Durham	Golden Louan Duke	M. Wick	Oroville.
Red	Frantic Louan 13th, Durham	Golden Louan Duke	M. Wick	Oroville.
Red	Frantic Louan 14th, Durham	Golden Louan Duke	M. Wick	Oroville.
Red	Frantic Louan 19th, Durham	Golden Louan Duke	M. Wick	Oroville.
Red	Oxford Beau, Durham	(See classes)	J. D. Carr	Gabilan.
Roan	1st Belle of Gabilan, Durham	(See classes)	J. D. Carr	Gabilan.
Red & white	Fairy Queen, 5th, Durham	(See classes)	J. D. Carr	Gabilan.
Red	18th Maid of Monterey, Durham	(See classes)	J. D. Carr	Gabilan.
Roan	Lady Oxford 2d, Durham	(See classes)	J. D. Carr	Gabilan.
Red	7th Red Thorndale, Durham	Master Maynard	C. Younger	Forest Home.
Red	6th Rose of Forest Home, Durham	Red Thorndale	C. Younger	Forest Home.
Red	6th Rosa Nell, Durham	Red Thorndale	C. Younger	Forest Home.
Red	Oxford Rose, Durham	Red Thorndale	C. Younger	Forest Home.
Red	Amelia 8th, Durham	Red Thorndale	C. Younger	Forest Home.
Red	10th Red Thorndale, Durham	Red Thorndale	C. Younger	Forest Home.
Red	Red Dolly 6th, Durham	Red Thorndale	C. Younger	Forest Home.

Red	Red Dolly 7th, Durham	Red Thorndale	C. Younger	Forest Home.
Red	7th Rose of Forest Home, Durham	Red Thorndale	C. Younger	Forest Home.
Red	Oxford Rose 3d, Durham	Red Thorndale	C. Younger	Forest Home.

CLASS II—GRADED CATTLE.

Color.	Name.	Sire.	Owner.	Residence.
		COWS.		
		Four Years Old and Over.		
Red & white	Maggie, Durham	Water Prince	Robert Ashburner	Baden Station.
Spotted	May Queen, Durham	First Duke of Yolo	E. Comstock	Yolo County.
Red	Bettie, Durham	Monkey John	E. Comstock	Yolo County.
Roan	Daisy, Durham	Loume	P. H. Murphy	Brighton.
		Three Years Old.		
Red	Lucy, Durham	Marc Antony	Robert Ashburner	Baden Station.
Red	Pug, Durham	First Duke of Yolo	E. Comstock	Yolo County.
Red	Rosette 9th, Durham	Monkey John	P. H. Murphy	Brighton.
		Two Years Old.		
Red	Pet, Durham	First Duke of Yolo	E. Comstock	Yolo County.
		One Year Old.		
Red	Rosa, Durham	Leopard	E. Comstock	Yolo County.
Red & white	Nellie, Jersey	Volunteer	P. H. Murphy	Brighton.
Red & white	Harriet, Durham and Ayrshire	Dunbar	P. J. Merkeley	Sacramento.
		Heifer Calves.		
Red & white	Blossom, Jersey	Thompson's Jersey Bull	E. W. Maslin	Sacramento.
Red	Beauty, Durham	Leopard	E. Comstock	Yolo County.
		Milch Cows.		
Roan	Missouri, Durham	First Duke of Yolo	E. Comstock	Yolo County.
Brown & white	Lady Chapin	McDonald	George Bennett	Redwood.

CLASS III.—SWEEPSTAKES.

BULLS OF ANY AGE OR BREED.

Color.	Name.	Sire.	Owner.	Residence.
Solid	Buffalo Bill, Jersey	Keystone	Robert Beck	Oakland.
Red	Major Butler, Durham	Orlando	M. Wick	Oroville.
Red	Cottenwood Louan 12th, Durham	Golden Louan Duke	M. Wick	Oroville.
Red	Golden Wreath, Durham	Major Butler	M. Wick	Oroville.
Brown & white	Melanethon Callaghan, Ayrshire	Heber Kimball	George Bement	Redwood.
Red	11th Duke of Gabilan, Durham	(See classes)	J. D. Carr	Gabilan.
Red	Independence, Durham	(See classes)	J. D. Carr	Gabilan.
Red	Gwin Prince, Durham	(See classes)	Charles Clark	Milpitas.
Red & white	Great Prince of Lightbourne, Durham	2d Duke of Gloucester	Robert Ashburner	Baden Station.
Red	Baden Duke, Durham	Kirklevington Duke 2d	Robert Ashburner	Baden Station.
Red	Red Thorndale, Durham	Thorndale	C. Younger	Forest Home.
Red	7th Red Thorndale, Durham	Red Thorndale	C. Younger	Forest Home.
Red	2d Duke of Alameda, Durham	Master Maynard	C. Younger	Forest Home.
Red	Leopard, Durham	Master Maynard	C. Younger	Forest Home.
		COWS OF ANY AGE OR BREED.		
Solid	Ida, Jersey	(See classes)	Robert Beck	Oakland.
Red	Gem, Durham	Crown Prince	M. Wick	Oroville.
Red	Venis, Durham	Red Cloud	M. Wick	Oroville.
Red	Frantic Louan 1st, Durham	Golden Louan Duke	M. Wick	Oroville.
Red	Frantic Louan 6th, Durham	Golden Louan Duke	M. Wick	Oroville.
Red	Frantic Louan 12th, Durham	Golden Louan Duke	M. Wick	Oroville.
Red	Frantic Louan 14th, Durham	Golden Louan Duke	M. Wick	Oroville.
Red	Matilda, Durham	Major Butler	M. Wick	Oroville.
Red	3d Maid of Monterey, Durham	(See classes)	J. D. Carr	Gabilan.
Red & white	Dinah 6th, Jersey	(See classes)	Robert Beck	Oakland.
Solid	Ida 2d, Jersey	(See classes)	Robert Beck	Oakland.
Roan	Pet of Geneva, Durham	(See classes)	J. D. Carr	Gabilan.
Roan	Pearl 2d of Yerba Buena, Jersey	Ralston	H. Pierce	San Francisco.
Roan	Duchess of York 15th, Durham	(See classes)	Charles Clark	Milpitas.
Red & white	Maggie, Ayrshire	Imported	George Bement	Redwood.
Red	Red Dolly 2d, Durham	Airdrie Thorndale	C. Younger	Forest Home.
Roan	1st Golden Gate, Durham	Thorndale	C. Younger	Forest Home.
Red	Dolly Thorndale, Durham	Thorndale	C. Younger	Forest Home.
Red	2d Rose of Forest Home, Durham	Thorndale	C. Younger	Forest Home.
Red	6th Rose of Forest Home, Durham	Red Thorndale	C. Younger	Forest Home.

CLASS III—SWEEPSTAKES.

BULLS, AND THREE OF HIS CALVES UNDER ONE YEAR OLD.

Color.	Name.	Sire.	Owner.	Residence.
Solid	Buffalo Bill, Jersey	(See classes)	Robert Beck	Oakland.
Solid	Ida 2d's heifer calf, Jersey	(See classes)	Robert Beck	Oakland.
	Jersey Doll's twins, Jersey	(See classes)	Robert Beck	Oakland.
	Dinah's heifer calf, Jersey	(See classes)	Robert Beck	Oakland.
Red	Major Butler, Durham	Orlando	M. Wick	Oroville.
Red	Golden Wreath, Durham	(See classes)	M. Wick	Oroville.
Red	Frantic Louan 22d, Durham	(See classes)	M. Wick	Oroville.
Red	Frantic Louan 23d, Durham	(See classes)	M. Wick	Oroville.
Red	Matilda, Durham	(See classes)	M. Wick	Oroville.
Red	Gwin Prince, Durham	(See classes)	Charles Clark	Milpitas.
Red	Milpitas Prince, Durham	(See classes)	Charles Clark	Milpitas.
Red	Ruby's Prince, Durham	(See classes)	Charles Clark	Milpitas.
Red	Dutchy's Prince, Durham	(See classes)	Charles Clark	Milpitas.
Red	Red Thorndale, Durham	Thorndale	C. Younger	Forest Home.
Red	7th Rose of Forest Home, Durham	Red Thorndale	C. Younger	Forest Home.
Red	Red Dolly 7th, Durham	Red Thorndale	C. Younger	Forest Home.
Red	Oxford Rose 3d, Durham	Red Thorndale	C. Younger	Forest Home.
Red & white	Great Prince of Lightborne, Durham	2d Duke of Gloucester	R. Ashburner	Baden Station.
Roan	Cherry Prince, Durham	(See classes)	R. Ashburner	Baden Station.
Red	Goldfinder, Durham	(See classes)	R. Ashburner	Baden Station.
Red	Baden Duke 4th, Durham	(See classes)	R. Ashburner	Baden Station.

FIRST DEPARTMENT—Continued.

CLASS I—SHEEP.

SPANISH MERINO—RAMS.

Name.	Owner.	Residence.
Two Years Old and Over.		
Columella	E. W. Woolsey	Berkeley.
Silk Stockings	J. H. Strowbridge	Haywards.
Long Wool, Senior	E. W. Woolsey	Berkeley.
Pride of Stonehedge	E. W. Woolsey	Berkeley.
One Year Old and Under Two.		
Long Wool, Junior	E. W. Woolsey	Berkeley.
Sprightly	J. H. Strowbridge	Haywards.
Ram Lambs.		
Three ram lambs	E. W. Woolsey	Berkeley, Alameda County.
Three ram lambs	J. H. Strowbridge	Haywards, Alameda County.
EWES.		
Two Years Old and Over.		
Pen of five ewes	E. W. Woolsey	Berkeley, Alameda County.
Pen of five ewes	J. H. Strowbridge	Haywards, Alameda County.
One Year Old and Under Two.		
Pen of five ewes	E. W. Woolsey	Berkeley.
Pen of five ewes	J. H. Strowbridge	Haywards.
EWE LAMBS.		
Pen of five ewe lambs	E. W. Woolsey	Berkeley.
Pen of five ewe lambs	J. H. Strowbridge	Haywards.
RAMS AND LAMBS.		
Ram and five of his lambs.		
Columella and five lambs	E. W. Woolsey	Berkeley.
Silk Stockings and five lambs	J. H. Strowbridge	Haywards.

CLASS II—FRENCH MERINO AND SILESIAN RAMS.

Two Years Old and Over.		
Leopold, French Merino	Mrs. R. Blacow	Centerville, Alameda County.
Gladiator, French Merino	Mrs. R. Blacow	Centerville, Alameda County.
One Year Old and Under Two.		
Sultan Second, French Merino	Mrs. R. Blacow	Centerville, Alameda County.
Bulger, French Merino	Mrs. R. Blacow	Centerville, Alameda County.
Ram Lambs.		
Three ram lambs, French Merino	Mrs. R. Blacow	Centerville, Alameda County.
EWES.		
Two Years Old and Over.		
Pen of five ewes	Mrs. R. Blacow	Centerville, Alameda County.
One Year Old and Under Two.		
Pen of five ewes, French Merino	Mrs. R. Blacow	Centerville, Alameda County.
Pen of five ewes	Mrs. R. Blacow	Centerville, Alameda County.

CLASS II.—FRENCH MERINO AND SILESIAN RAMS—Continued.

Name.	Owner.	Residence.
Ewe Lambs.		
Pen of five ewe lambs	Mrs. R. Blacow	Centerville, Alameda County.
Rams and Lambs.		
Leopold and five of his lambs	Mrs. R. Blacow	Centerville, Alameda County.

CLASS III—RAMS—COTSWOLD, LEICESTERSHIRE, LINCOLNSHIRE, SHROPSHIRE, AND A CROSS BETWEEN ANY TWO THOROUGHBREDS.

Two Years Old and Over.		
Far West, Cotswold	C. Younger	Forest Home, Santa Clara County.
One Year Old and Under Two.		
No name, Cotswold	C. Younger	Forest Home.
Ram Lambs.		
Three ram lambs, Cotswold	C. Younger	Forest Home.
EWES.		
Two Years Old and Over.		
Pen of five ewes, Cotswold	C. Younger	Forest Home.
One Year Old and Under Two.		
Pen of five ewes, Cotswold	C. Younger	Forest Home.
Ram and five of his lambs.		
Far West and five of his lambs, Cotswold	C. Younger	Forest Home.
SWEEPSTAKES.		
Ram, any age or breed, and five of his lambs.		
Columella and five lambs, Spanish Merino	E. W. Woolsey	Berkeley.
Leopold and five lambs, French Merino	Mrs. R. Blacow	Centerville.
Silk Stockings and five lambs, Spanish Merino	J. H. Strowbridge	Haywards.

CLASS III.—GOATS.

THOROUGHBREDS—BUCKS.		
Two Years Old and Over.		
Scotchman, Angora	M. Wick	Oroville.
Pasha, Angora	John S. Harris	Hollister, San Benito County.
Under Two Years Old.		
Scotchman 2d, Angora	M. Wick	Oroville.
Scotchman 3d, Angora	M. Wick	Oroville.
Burns, Angora	John S. Harris	Hollister.
Wallace, Angora	John S. Harris	Hollister.
Bruce, Angora	John S. Harris	Hollister.

Class III—Goats—Continued.

Name.	Owner.	Residence.
Pen of not less than Three Does Two Years Old and Over.		
Lily, Lucy, and Fanny, Angora	M. Wick	Oroville.
Betsy Bell, Mary Gray, and Maid of the Mist, Angora	J. S. Harris	Hollister.
Pen three does, Angora	Bart. Cavanaugh	Sacramento.
Highland Mary, Scottish Queen. and Jennie Gleson	J. S. Harris	Hollister.
Pen of Three Does Under Two Years Old.		
Frantic 1st, 2d, and 3d, Angora	M. Wick	Oroville.
Pen of three does, Angora	Jno. S. Harris	Hollister.
GRADED GOATS.		
Pen of Three Does Two Years Old and Over.		
Pen of three does, Angora	Jno. S. Harris	Hollister.
Pen of Three Does Under Two Years Old.		
Pen of three does, Angora	Jno. S. Harris	Hollister.
SWEEPSTAKES—BUCKS.		
Pasha, Angora	Jno. S. Harris	Hollister.
Scotchman, Angora	M. Wick	Oroville.
DOES.		
Maid of the Mist, Angora	Jno. S. Harris	Hollister.
Pen of not less than Ten Kids.		
Pen of ten kids	Jno. S. Harris	Hollister.

CLASS I.—SWINE.

BOARS—BERKSHIRE.		
Two Years Old and Over.		
Black Prince of Linden	T. B. Valentine	San Francisco.
Commodore	John Rider	Sacramento.
Mike	E. Comstock	Yolo County.
Under Two Years Old.		
Commodore No. 2	John Rider	Sacramento.
Prince	John Kennedy	Sacramento.
Six Months, and under One Year.		
Richard of Linden	M. D. Boruck	San Francisco.
Canute No. 2	John Rider	Sacramento.
Jim	E. Comstock	Yolo County.
BREEDING SOWS.		
Hattie of Linden	T. B. Valentine	San Francisco.
Lady Knapp	John Rider	Sacramento.
Nellie	Hugh Cove	Sacramento River, Yolo Co.
Susie	E. Comstock	Yolo County.
Six Months, and Under One Year.		
Mollie	M. D. Boruck	San Francisco.
Queen Bess	M. D. Boruck	San Francisco.
May Queen	John Rider	Sacramento.
Fannie	Hugh Cove	Sacramento River, Yolo Co.
Berk	E. Comstock	Yolo County.

Class I—Swine—Continued.

Name.	Owner.	Residence.
Pair Pigs Under Ten Months Old.		
Victor and Pino	John Rider	Sacramento.
Pair of pigs	Hugh Cove	Sacramento River, Yolo Co.
Jake and Bettie	E. Comstock	Yolo County.
BOARS—POLAND CHINA AND CHESTER WHITE.		
Two Years Old and Over.		
Captain Jenks	Elias Gallup	Hanford, Tulare County.
Under Two Years Old.		
California Peerless	Elias Gallup	Hanford, Tulare County.
Six Months Old and under One Year.		
Comic	Elias Gallup	Hanford, Tulare County.
BREEDING SOWS.		
Belladonna	Elias Gallup	Hanford, Tulare County.
SOWS.		
Six Months, and under One Year.		
Rosalind Starr	Elias Gallup	Hanford, Tulare County.
PIGS.		
Pairs under Ten Months Old.		
Willie and Flora, Poland China	L. N. Scott	Lincoln, Placer County.
Prince and Jonesa	E. Gallup	Hanford, Tulare County.
SWEEPSTAKES.		
Boar, any age or breed.		
Commodore, Berkshire	John Rider	Sacramento.
Mike	E. Comstock	Yolo County.
Sow of any age or breed.		
Princess of Wooddale	John Rider	Sacramento.
Susie	E. Comstock	Yolo County.
Pen of Six Pigs, any age or breed.		
Three Boars and three Sows, Berkshire	John Rider	Sacramento.
Pen six Pigs	Hugh Cove	Sacramento River, Yolo Co.
Pen six Pigs	E. Comstock	Yolo County.
Family, all same breed, one Boar, two Sows, and six Pigs, of any age.		
Commodore, Princess of Wooddale, Lady Knapp, and six Pigs	John Rider	Sacramento.
Mike, Susie, Bettie, and ten Pigs	E. Comstock	Yolo County.

POULTRY.

Exhibitor.	Residence.	Article.
CHICKENS.		
T. D. Morris	Sonoma	Trio Light Brahmas.
T. D. Morris	Sonoma	Trio Dark Brahmas.
T. D. Morris	Sonoma	Trio Buff Cochins.
T. D. Morris	Sonoma	Trio Partridge Cochins.
T. D. Morris	Sonoma	Trio White Cochins.
T. D. Morris	Sonoma	Trio Black Cochins.
T. D. Morris	Sonoma	Trio Red Breasted Games.
T. D. Morris	Sonoma	Trio Brown Red Games.
T. D. Morris	Sonoma	Trio Malay Games.
T. D. Morris	Sonoma	Trio Golden Spangled Hamburgs.
T. D. Morris	Sonoma	Trio Silver Spangled Hamburgs.
T. D. Morris	Sonoma	Trio Black Hamburgs.
T. Waite	Brighton	Trio White Leghorns.
N. Neiley	Sacramento	Trio White Leghorns.
T. Waite	Brighton	Two trios Brown Leghorns.
T. D. Morris	Sonoma	One trio Brown Leghorns.
Mrs. L. E. McMahon	Dixon	Eight trios Brown Leghorns.
T. D. Morris	Sonoma	One trio Black Spanish.
F. S. George	Sacramento	One trio Black Spanish.
E. S. Hart	Florin	One trio Black Spanish.
E. Gallup	Hanford, Tulare County	One trio White Dorkings.
T. D. Morris	Sonoma	One trio Silver Gray Dorkings.
T. D. Morris	Sonoma	One trio Dominiques.
T. D. Morris	Sonoma	One trio Plymouth Rocks.
J. N. Fuller	Sacramento	Two trios Plymouth Rocks.
Mrs. L. E. McMahon	Dixon	Six trios Plymouth Rocks.
T. D. Morris	Sonoma	One trio Black Polish.
T. D. Morris	Sonoma	One trio Silver Polish.
T. D. Morris	Sonoma	One trio White Polish.
T. D. Morris	Sonoma	One trio French Fowls.
T. D. Morris	Sonoma	One trio Black Breasted Red Bantams.
Mrs. L. E. McMahon	Dixon	Two trios Black Breasted Red Bantams.
C. W. Rapp	Sacramento	One trio Golden Seabright.
TURKEYS.		
T. D. Morris	Sonoma	One pair Bronze.
T. D. Morris	Sonoma	One pair White Holland.
T. D. Morris	Sonoma	One pair Wild.
Mrs. L. E. McMahon	Dixon	Two trios Bronze.
DUCKS AND GEESE.		
E. S. Hart	Florin	One pair Rouen Ducks.
T. D. Morris	Sonoma	Aylisbury Ducks.
T. D. Morris	Sonoma	One pair Pekin Ducks.
J. N. Fuller	Sacramento	Four pairs Pekin Ducks.
E. Gallup	Hanford, Tulare County	One pair Pekin Ducks.
T. D. Morris	Sonoma	One pair Cayuga Ducks.
T. D. Morris	Sonoma	One pair Toulouse Geese.
John Rider	Sacramento	One pair Toulouse Geese.
T. D. Morris	Sonoma	One pair Bremen Geese.
T. D. Morris	Sonoma	One pair China Geese.

SECOND DEPARTMENT.

CLASS I.—MACHINERY, ENGINES, ETC.

Exhibitor.	Residence.	Article.
M. R. Rose	Sacramento	One steam engine.

CLASS II.—FIRST DIVISION.

AGRICULTURAL MACHINES.

M. C. Hawley & Co.	Sacramento	One Hutchinson cider mill.
M. C. Hawley & Co.	Sacramento	One Buckeye cider mill.
M. C. Hawley & Co.	Sacramento	Three rawhide roller hay cutters.
M. C. Hawley & Co.	Sacramento	Two Burdick roller hay cutters.
M. C. Hawley & Co.	Sacramento	One Taylor hand dump horse hay rake.
M. C. Hawley & Co.	Sacramento	One Taylor self dump horse hay rake.
M. C. Hawley & Co.	Sacramento	Three Orchard's post-hole augers.
M. C. Hawley & Co.	Sacramento	Four Orchard's well augers.
Geo. O. Bates & Co.	Sacramento	One No. 2 Junior cider mill.
Geo. O. Bates & Co.	Sacramento	One rawhide roller hay cutter.
Geo. O. Bates & Co.	Sacramento	One St. Louis hay cutter (improved).
Geo. O. Bates & Co.	Sacramento	One Eclipse hand corn sheller.
Geo. O. Bates & Co.	Sacramento	One President lawn mower.
Holman, Stanton & Co.	Sacramento	One Buckeye Sr. cider mill.
Holman, Stanton & Co.	Sacramento	One Furst & Bradley's horse hay rake.
Holman, Stanton & Co.	Sacramento	One Whiteman's hay cutter.
Holman, Stanton & Co.	Sacramento	One Eclipse hand corn sheller.
Holman, Stanton & Co.	Sacramento	One President lawn mower.
Baker & Hamilton	Sacramento	One Burrell hand corn sheller.
Baker & Hamilton	Sacramento	One Burdick hay cutter.
Baker & Hamilton	Sacramento	One self-sharpening hay cutter.
Baker & Hamilton	Sacramento	One rawhide roller hay cutter.
Geo. O. Bates & Co.	Sacramento	One Belcher hand corn sheller.
King & Rose	Sacramento	One Economy sweep horse-power.
M. R. Rose	Sacramento	One sweep horse-power.

CLASS III.—SECOND DIVISION.

AGRICULTURAL MACHINES.

M. C. Hawley & Co.	Sacramento	One Buckeye wheat drill.
M. C. Hawley & Co.	Sacramento	One Buckeye broadcast grain sowing machine.
M. C. Hawley & Co.	Sacramento	One Meadow King mowing machine.
M. C. Hawley & Co.	Sacramento	One Keystone horse-power corn planter.
M. C. Hawley & Co.	Sacramento	Two cultivators.
M. C. Hawley & Co.	Sacramento	One Cahoon broadcast grain sowing machine.
M. C. Hawley & Co.	Sacramento	One riding corn cultivator.
M. C. Hawley & Co.	Sacramento	One Advance walking corn cultivator.
F. A. Kelley	Sacramento	One elevator for stacking grain.
Batchelor, Van Gelder & Co.	Sacramento	Six spring tooth harrows.
Batchelor, Van Gelder & Co.	Sacramento	Three spring tooth cultivators.

Class III—Second Division—Continued.

Exhibitor.	Residence.	Article.
Batchelor, Van Gelder & Co.	Sacramento	One spring tooth broadcast sowing machine.
Griffeth & Burke	Yolo	One Randall pulverizing harrow.
Chas. Keehner	Roseville	Four iron sectional "A" harrows.
Geo. O. Bates & Co.	Sacramento	One Empire mowing machine.
Holman, Stanton & Co.	Sacramento	One Woods self-binding harvester.
Holman, Stanton & Co.	Sacramento	One Woods self-rake reaping machine.
Holman, Stanton & Co.	Sacramento	One Woods mowing machine.
Holman, Stanton & Co.	Sacramento	One La Dow pulverizing harrow.
Holman, Stanton & Co.	Sacramento	One riding and walking corn cultivator.
Holman, Stanton & Co.	Sacramento	One Cahoon broadcast sowing machine.
D. H. Corthell	Stockton	One spring tooth harrow.
Baker & Hamilton	Sacramento	One Hill header.
Baker & Hamilton	Sacramento	One Gem broadcast sowing machine.
Baker & Hamilton	Sacramento	One Champion mowing machine.
Baker & Hamilton	Sacramento	One Buckeye mower.
Baker & Hamilton	Sacramento	One horse-power corn planter.
Baker & Hamilton	Sacramento	One hand corn planter.
Baker & Hamilton	Sacramento	One harrow.
Baker & Hamilton	Sacramento	One one-horse cultivator.
Baker & Hamilton	Sacramento	Two chisel cultivators.
Baker & Hamilton	Sacramento	One horse hoe.
Baker & Hamilton	Sacramento	One Gohram broadcast sowing machine with cultivator attachment.
J. C. Shofner	San Francisco	One Sherrill broadcast sowing machine with cultivator attachment.
A. W. Lockheart	Sacramento	One self-feeder for thrashing machine.
Byron Jackson	San Francisco	One Jackson's feeder and elevator with Bayley's separator.
Byron Jackson	San Francisco	One Jackson's feeder with Bayley's separator.
Holeman, Stanton & Co.	Sacramento	One McCormick mowing machine.
William Gutenberger	Sacramento	One field roller and crusher.

CLASS IV.—THIRD DIVISION.

AGRICULTURAL MACHINES.

M. C. Hawley & Co.	Sacramento	One Champion fanning mill.
M. C. Hawley & Co.	Sacramento	One Challenge farm feed mill.
M. C. Hawley & Co.	Sacramento	One Nordyke & M. farm feed mill.
M. C. Hawley & Co.	Sacramento	One pair Howe's platform scales.
Rusley & Merry	Chico	One farm feed mill.
D. E. Goldsmith	San Francisco	Two iron turbine windmills.
H. D. Nash & Co.	Sacramento	One power grain separator.
J. Klees & Co.	Sacramento	One Nash & Cutts reimproved fanning mill.
J. Klees & Co.	Sacramento	One Nash & Cutts reimproved grain separator.
H. Brightman	Placerville	One farm gate.
James Compton	Willows	One farm gate.
Holman, Stanton & Co.	Sacramento	One Nash & Cutts fanning mill.
Holman, Stanton & Co.	Sacramento	One Little Chief fanning mill.
Holman, Stanton & Co.	Sacramento	One Challenge farm feed mill.
H. D. Nash & Co.	Sacramento	One hand fanning mill.
Baker & Hamilton	Sacramento	One California farm feed mill.
Baker & Hamilton	Sacramento	One Queen of South feed mill.
Baker & Hamilton	Sacramento	One American feed mill.
Baker & Hamilton	Sacramento	One Stafford hand feed mill.
A. D. Miller	Walsh's	One Harris windmill.
King & Rose	Sacramento	One Rose self-regulating windmill.
G. Saccore	Sutterville	One horizontal windmill.
William Gutengerger	Sacramento	One farm feed mill.

CLASS V.—TOOLS AND HOUSEHOLD IMPLEMENTS.

Exhibitor.	Residence.	Article.
M. C. Hawley & Co.	Sacramento	One Humboldt washing machine.
B. Peeler	Mono	One Forrester double-acting force pump.
D. E. Goldsmith	San Francisco	Three Buckeye double-acting force well pumps.
T. M. Lash	Sacramento	One adjustable fruit gatherer.
T. M. Lash	Sacramento	One Hector stone cylinder force pump.
R. M. Beebee	Gridley	Apparatus for raising water for irrigating purposes.
Baker & Hamilton	Sacramento	One revolving road scraper.
Baker & Hamilton	Sacramento	Three garden seed drills.
M. R. Rose	Sacramento	Two well pumps.
M. R. Rose	Sacramento	Apparatus for raising water for irrigating purposes.

CLASS VI.—PLOWS.

M. C. Hawley & Co	Sacramento	One Deere two-gang plow.
M. C. Hawley & Co	Sacramento	One Meyers' two-gang plow.
M. C. Hawley & Co	Sacramento	One Gilpin sulky plow.
M. C. Hawley & Co	Sacramento	One Deere stubble plow—gang plow, No. 3.
M. C. Hawley & Co	Sacramento	Eleven Deere steel plows.
M. C. Hawley & Co	Sacramento	One Deere subsoil plow.
M. C. Hawley & Co	Sacramento	One Knapp sidehill plow.
M. C. Hawley & Co	Sacramento	One Deere one-horse plow.
M. C. Hawley & Co	Sacramento	Three Collins' steel plows.
M. C. Hawley & Co	Sacramento	Three South Bend chilled plows.
M. C. Hawley & Co	Sacramento	One Deere road plow.
Geo. O. Bates & Co	Sacramento	Two Avery steel plows.
Geo. O. Bates & Co	Sacramento	One Avery breaking plow.
Geo. O. Bates & Co	Sacramento	One Avery iron beam steel plow.
Holman, Stanton & Co	Sacramento	One Cassidy two-gang plow.
Holman, Stanton & Co	Sacramento	One Brown two-gang plow.
Holman, Stanton & Co	Sacramento	Two Furst & Bradley two-gang plows.
Holman, Stanton & Co	Sacramento	One Furst & Bradley sulky plow.
Holman, Stanton & Co	Sacramento	One Oliver No. 40 stubble plow.
Holman, Stanton & Co	Sacramento	One Oliver No. 30 sod plow.
Holman, Stanton & Co	Sacramento	One Oliver No. 10 one-horse plow.
Holman, Stanton & Co	Sacramento	Nine Oliver chilled plows.
Holman, Stanton & Co	Sacramento	Eight Furst & Bradley steel plows.
Holman, Stanton & Co	Sacramento	Seven Blackhawk steel plows.
Holman, Stanton & Co	Sacramento	One Oliver No. 20 plow, for all purposes.
Holman, Stanton & Co	Sacramento	One Diston Dynamometer.
Baker & Hamilton	Sacramento	Six Eureka two-gang plows.
Baker & Hamilton	Sacramento	Two Eureka sulky plows.
Baker & Hamilton	Sacramento	One Hill's stubble plow.
Baker & Hamilton	Sacramento	One Hill's sod plow.
Baker & Hamilton	Sacramento	One Hill's steel plow.
Baker & Hamilton	Sacramento	One Hill's subsoil plow.
Baker & Hamilton	Sacramento	Two Hill's one-horse plows.
Baker & Hamilton	Sacramento	One Hill's plow for all purposes.
Baker & Hamilton	Sacramento	One Hill's road plow.
Baker & Hamilton	Sacramento	One Eureka deep filler sulky plow.
Baker & Hamilton	Sacramento	Ten Gale chilled plows.
Baker & Hamilton	Sacramento	One Eureka No. 3 gang plow.
Baker & Hamilton	Sacramento	One Grangers' gang plow, with seed-sower attachment.
Baker & Hamilton	Sacramento	General display in Second Department.
J. C. Shofner	San Francisco	One Sherrill No. 4 gang plow.

CLASS VII.—VEHICLES.

Exhibitor.	Residence.	Article.
M. C. Hawley & Co	Sacramento	One Schuttler farm wagon for general purposes.
M. C. Hawley & Co	Sacramento	General display in Second Department.
J. F. Hill	Sacramento	Four top buggies.
J. F. Hill	Sacramento	Five open buggies.
J. F. Hill	Sacramento	Two business wagons.
J. F. Hill	Sacramento	Two farm wagons for general purposes.
J. F. Hill	Sacramento	One freight wagon.
J. F. Hill	Sacramento	One spring market wagon.
J. F. Hill	Sacramento	One street goods wagon.
J. F. Hill	Sacramento	One lady's phaeton.
J. F. Hill	Sacramento	Three spring wagons (one with top).
J. F. Hill	Sacramento	One thoroughbrace wagon.
Studebaker Bros	Sacramento	One top buggy.
Studebaker Bros	Sacramento	One open buggy.
Studebaker Bros	Sacramento	One spring market wagon.
Studebaker Bros	Sacramento	Two farm wagons for general purposes.
Larkins & Co	San Francisco	One top buggy.
Larkins & Co	San Francisco	One open buggy.
Larkins & Co	San Francisco	One two-horse family carriage.
Larkins & Co	San Francisco	One two-seated open carriage.
Larkins & Co	San Francisco	One trotting wagon.
Larkins & Co	San Francisco	One track sulky.
Larkins & Co	San Francisco	One ladies' phaeton.
Johnson & Blue	Sacramento	One two-seated open carriage.
Nelson Bros	Sacramento	Two open buggies.
Wm. Newald	San Francisco	Two two-seated Openheim open carriages.
Wm. Newald	San Francisco	One one-horse Openheim family carriage.
George O. Bates & Co.	Sacramento	Two farm wagons for general purposes.
M. J. McCue	San Francisco	One open buggy.
M. J. McCue	San Francisco	One two-seated open carriage.
J. F. Davis & Son	Sacramento	One two-horse family carriage.
J. F. Davis & Son	Sacramento	Two top buggies.
J. F. Davis & Son	Sacramento	One open buggy.
J. F. Davis & Son	Sacramento	One two-seated T cart open carriage.
J. F. Davis & Son	Sacramento	One ladies' phaeton.
Holman, Stanton & Co.	Sacramento	Two farm wagons for general purposes.
Holman, Stanton & Co.	Sacramento	General display in Second Department.
A. Meister	Sacramento	Four open buggies.
A. Meister	Sacramento	One spring market wagon.
A. Meister	Sacramento	Two street goods wagons.
A. Meister	Sacramento	One top buggy.
A. Meister	Sacramento	General display in this line.
P. J. O'Brien	San Francisco	One open buggy.
Baker & Hamilton	Sacramento	Two two-horse family carriages.
Baker & Hamilton	Sacramento	One top buggy.
Baker & Hamilton	Sacramento	One open buggy.
Baker & Hamilton	Sacramento	One two-seated open carriage.
Baker & Hamilton	Sacramento	One two-seated thoroughbrace open carriage.
Baker & Hamilton	Sacramento	One farm wagon for general purposes.
Baker & Hamilton	Sacramento	One spring market wagon.
Baker & Hamilton	Sacramento	One ladies' phaeton.
Baker & Hamilton	Sacramento	One street goods wagon.
Baker & Hamilton	Sacramento	One iron header wagon gear.
Baker & Hamilton	Sacramento	General display in Second Department.
G. N. Scott	Madison	Two iron header wagon gears.
Johnson & Blue	Sacramento	Three open buggies.

MISCELLANEOUS DEPARTMENT.

Exhibitor.	Residence.	Article.
M. C. Hawley & Co.	Sacramento	One Parker hand corn-mill.
M. C. Hawley & Co.	Sacramento	One portable forge.
M. C. Hawley & Co.	Sacramento	One plow sulky.
M. C. Hawley & Co.	Sacramento	One log-sawing machine.
J. B. Tupper	Sacramento	One automatic stock feeder.
Faynton & Durickson	Clayton	One adjustable sidehill header wagon.
George O. Bates & Co.	Sacramento	One Avery transplanter.
George O. Bates & Co.	Sacramento	One coil of American barbed wire.
Holman, Stanton & Co.	Sacramento	Three coils Burris' barbed wire.
Holman, Stanton & Co.	Sacramento	Four extension step ladders.
Joseph Goyette	Stockton	Four Sherrill's stubble and weed turners.
Lewis Clark	Sacramento	One grain grader and seed cleaner.
Holman, Stanton & Co.	Sacramento	Two Fox lawn rakes.
Baker & Hamilton	Sacramento	Two wagon jacks.
Baker & Hamilton	Sacramento	Three store trucks.
Baker & Hamilton	Sacramento	Two garden barrows.
Baker & Hamilton	Sacramento	One portable forge.
Baker & Hamilton	Sacramento	One plow sulky.
J. L. Cook	San Francisco	One dry goldwasher.
Byron Jackson	San Francisco	Six Jackson light weight horse forks.
Byron Jackson	San Francisco	One tread horsepower.
King & Rose	Sacramento	One machine for manufacturing subirrigating pipe.
Holman, Stanton & Co.	Sacramento	One Globe horsefork.
W. E. Livermore	Los Gatos	Two Brown & Haggard's wagon tongue supporters.

THIRD DEPARTMENT.

CLASS I—TEXTILE FABRICS.

Exhibitor.	Residence.	Article.
Geo. A. Clark & Bro.	San Francisco	Display of O. N. T. spool cotton.
Weinstock & Lubin	Sacramento	General display of neckties and bows.
Weinstock & Lubin	Sacramento	General display of drygoods.
Weinstock & Lubin	Sacramento	General display of fancy goods.
Weinstock & Lubin	Sacramento	General display of gents' shirts.
Capital Woolen Mills	Sacramento	General display of woolen goods.
Capital Woolen Mills	Sacramento	General display of cloth of flax cotton.
Capital Woolen Mills	Sacramento	General display of cotton sheeting.
Capital Woolen Mills	Sacramento	General display of flax cotton.
Capital Woolen Mills	Sacramento	General display of kersey.
Capital Woolen Mills	Sacramento	General display of Mackinac blankets.
Capital Woolen Mills	Sacramento	General display of woolen shawls.
Capital Woolen Mills	Sacramento	General display of woolen stocking yarn.
Mrs. A. L. Hoyle	Sacramento	Hearth rug.
S. Lipman & Co.	Sacramento	General display of drygoods.
S. Lipman & Co.	Sacramento	General display of fancy goods.
S. Lipman & Co.	Sacramento	General display of Foster kid gloves.
Richard Dale & Co.	Sacramento	Display of stocking yarn.
Richard Dale & Co.	Sacramento	Display of fancy goods.
Richard Dale & Co.	Sacramento	Display of naval and military goods.
Richard Dale & Co.	Sacramento	Display of regalia and silk goods.
Mrs. J. R. Lawrie	Santa Clara	Display of rag carpet.

CLASS I.—TEXTILE FABRICS—Continued.

Exhibitor.	Residence.	Article.
S. J. Nathan & Co.	Sacramento	Thirty-two pairs imported silk half hose.
S. J. Nathon & Co.	Sacramento	Twenty-eight French silk handkerchiefs.
S. J. Nathan & Co.	Sacramento	Four Carrachee undershirts.
S. J. Nathan & Co.	Sacramento	Four pairs Carrachee drawers.
S. J. Nathan & Co.	Sacramento	Sixty-three French silk scarfs.
S. J. Nathan & Co.	Sacramento	Eighteen Windsor scarfs.
S. J. Nathan & Co.	Sacramento	Three white and lavender ties.
S. J. Nathan & Co.	Sacramento	Eleven opera satin ties.
S. J. Nathan & Co.	Sacramento	Two linen French hemsti'd handkerchiefs.
S. J. Nathan & Co.	Sacramento	Two dozen pairs linen cuffs.
S. J. Nathan & Co.	Sacramento	Two dozen initial handkerchiefs.
S. J. Nathan & Co.	Sacramento	Sixteen pairs suspenders.
S. J. Nathan & Co.	Sacramento	One dozen pairs woolen socks.
S. J. Nathan & Co.	Sacramento	Six dozen linen collars.
S. J. Nathan & Co.	Sacramento	Ten fancy undershirts and drawers.
S. J. Nathan & Co.	Sacramento	Eleven fancy ties.
S. J. Nathan & Co.	Sacramento	Fifteen silk suspenders.
S. J. Nathan & Co.	Sacramento	Fifty-four fancy handkerchiefs.
S. J. Nathan & Co.	Sacramento	Nine patent collar buttons.
S. J. Nathan & Co.	Sacramento	Twelve scarf pins.
S. J. Nathan & Co.	Sacramento	Twelve pairs sleeve buttons.
S. J. Nathan & Co.	Sacramento	Eight shirt studs.
S. J. Nathan & Co.	Sacramento	Six patent collar buttons.
S. J. Nathan & Co.	Sacramento	Ten night shirts.
S. J. Nathan & Co.	Sacramento	Twelve silk handkerchiefs.
S. J. Nathan & Co.	Sacramento	Nine Jouvin kid gloves.
S. J. Nathan & Co.	Sacramento	Twelve neckties.
S. J. Nathan & Co.	Sacramento	Two white shirts, Byron collar attached.
S. J. Nathan & Co.	Sacramento	Twelve French percale shirts.
Locke & Lavenson	Sacramento	General display of carpets and rugs.
Locke & Lavenson	Sacramento	General display of woolen carpets.
Locke & Lavenson	Sacramento	General display of hearth rugs.
John F. Cooper	Sacramento	One case zephyr wool.
John F. Cooper	Sacramento	One case fancy goods.
A. Hamburger	Sacramento	Display of silk.
A. Hamburger	Sacramento	Display of drygoods.
Tubbs & Co.	San Francisco	General display California made cordage.

CLASS II.—JUVENILE DEPARTMENT.

Miss A. B. Lawson, 11 years	Sacramento	Two lawn dresses.
Miss A. B. Lawson, 11 years	Sacramento	One dozen napkins.
Miss A. B. Lawson, 11 years	Sacramento	Three aprons.
Leslie Trowbridge, 17 years	Sacramento	One twine hammock.
Harry Owen, 13 years	Sacramento	One crayon drawing.
Alice Grover, 15 years	Sacramento	Six crayon drawings.
Emma Hohen, 11 years	Sacramento	One crayon drawing.
Lucy Preston, 7 years	Sacramento	One toilet set, four pieces.
Ida and Maud Lenoir, 6 and 8 years	Sacramento	One toilet set, six pieces.
A. Winans, 8 years	Sacramento	One splasher.
Addie Diersen, 4 years	Sacramento	One cardboard frame.
Addie Diersen, 4 years	Sacramento	One woven mat.
Fred. Hilliard, 4 yeras	Sacramento	One cardboard frame.
Horatio Stoll, 5 years	Sacramento	One cardboard frame.
J. Kerruise, 9 years	Sacramento	One cardboard frame.
Maud Anthony, 4 years	Sacramento	One woven mat.
T. D. Bernidia, 5 years	Sacramento	One woven mat.
Pupils of Mrs. C. M. Byrne	Sacramento	One air castle.
Nellie Gilson, 10 years	Sacramento	One pair pillow shams.
George Yuhre, 6 years	Sacramento	One cornucopia.
Frank Yuhre, 5 years	Sacramento	One cornucopia.

Class II.—Juvenile Department—Continued.

Exhibitor.	Residence.	Article.
Kate Meister, 9 years	Sacramento	One toilet set of seven pieces.
Kate Meister, 9 years	Sacramento	One pair pillow shams.
Kate Meister, 9 years	Sacramento	One child's bib.
Kate Meister, 9 years	Sacramento	One pincushion and motto.
Aaron Powers, 11 years	Sacramento	Three oil pictures.
Aaron Powers, 11 years	Sacramento	One crayon drawing.
Aaron Powers, 11 years	Sacramento	One pencil drawing.
Gertrude Miller, 6 years	Sacramento	Five knit worsted mats.
Phebe C. Brown, 12 years	Sacramento	One toilet set, five pieces.
Phebe C. Brown, 12 years	Sacramento	Lacework for pillow shams.
Phebe C. Brown, 12 years	Sacramento	One patchwork footstool.
Phebe C. Brown, 12 years	Sacramento	One tidy in linen canvas.
A. C. Winans, 7 years	Sacramento	One toilet set, eight pieces.
Lillie Cutter, 12 years	Sacramento	Two worsted mats.
Etta Seydel. 14 years	Sacramento	One bobinet bedset, three pieces.
Howard Bassett, 13 years	Sacramento	One walnut, carved frame clock.
Howard Bassett, 13 years	Sacramento	One hollywood carved frame clock.
Howard Bassett, 13 years	Sacramento	One maple carved frame pen rack.
Howard Bassett, 13 years	Sacramento	One pair carved easels with silhouettes.
Howard Bassett, 13 years	Sacramento	One wall pocket.
Mary E. Aiken, 14 years	Sacramento	One lace dress.
Mary E. Aiken, 14 years	Sacramento	One pair pillow shams.
Mary E. Aiken, 14 years	Sacramento	One lace toilet set, six pieces.
Mary E. Aiken, 14 years	Sacramento	One lace tidy.
Mary E. Aiken, 14 years	Sacramento	Four worsted mats.
Mary E. Aiken	Sacramento	One pair fairy boots.
Mary E. Aiken	Sacramento	One pearl-bead book mark.
Mary E. Aiken	Sacramento	Three catchalls.
Mary E. Aiken	Sacramento	One card-board book mark.
Mary E. Aiken	Sacramento	Two card-board frames.
Mary E. Aiken	Sacramento	Two card-board scratch-my-backs.
Mary E. Aiken	Sacramento	One worsted ottoman-cover.

CLASS III.

NEEDLE, SHELL, AND WAX WORK, CLOTHING, HATS, CAPS, FURS, ETC.

Mrs. M. A. Morehead	Sacramento	One embroidered table-spread.
Mrs. M. A. Morehead	Sacramento	One embroidered and beaded lambrequin.
Miss Kitty Walther	Sacramento	One worsted table-cover.
Miss Kitty Walther	Sacramento	Two chair stripes. in crewel work.
Miss Kitty Walther	Sacramento	One embroidered sofa-cushion.
Miss Kitty Walther	Sacramento	One toilet set, thirteen pieces.
Miss Kitty Walther	Sacramento	One chair set, three pieces.
Miss Kitty Walther	Sacramento	One set table mats, five pieces.
Miss Kitty Walther	Sacramento	One crochet shawl.
Miss Kitty Walther	Sacramento	One Adia canvas tidy.
Mrs. M. A. Morehead	Sacramento	Two lace hand-made handkerchiefs.
R. B. Powell	Sacramento	One worsted rug.
Mrs. P. J. Quack	Sacramento	One pair silk knit stockings.
Mrs. P. J. Quack	Sacramento	One pair wool knit stockings.
Mrs. H. C. Gardner	Sacramento	One sofa cushion.
Mrs. H. C. Gardner	Sacramento	Three crochet tidies.
Mrs. L. L. Landerkin	Sacramento	One case wax-work, Ascension of Christ.
Mrs. L. L. Landerkin	Sacramento	One case wax-work, Descent from the Cross.
Mrs. L. L. Landerkin	Sacramento	One case skeleton leaves.
Mrs. L. L. Landerkin	Sacramento	One case stitch-work.
Mrs. L. L. Landerkin	Sacramento	Two pieces wax-work.
Mrs. S. E. Glover	Sacramento	One specimen in crewel work.
Mrs. J. M. Bisaillion	Sacramento	One embroidered baby cloak.
J. D. Clevenger	Sacramento	One lamp-stand mat.
H. C. Megerlie	Sacramento	Display of ornamental grasses.

Class III.—Needle, Shell, Wax Work, etc.—Continued.

Exhibitor.	Residence.	Article.
H. C. Megerlie	Sacramento	Display of feathers, California manufacture.
Miss Nellie Rogers	Sacramento	Five pieces of point lace work.
Miss Nellie Rogers	Sacramento	One piece worsted embroidery.
Miss Nellie Rogers	Sacramento	One worsted sofa cushion.
Miss Nellie Rogers	Sacramento	Four pieces of moss work.
Miss L. St. Clair	Vallejo	One worsted worked chair back and stripe.
Weinstock & Lubin	Sacramento	Display of boys' clothing.
Weinstock & Lubin	Sacramento	Display of men's clothing.
Weinstock & Lubin	Sacramento	Display of hats and caps.
Mrs. M. E. Williams	Sacramento	Lace work for pillow shams.
Rosa Waters	Sacramento	Four patchwork quilts.
Mrs. C. Hahn	Sacramento	One crochet bedspread.
Mrs. C. Hahn	Sacramento	Two crochet pillow shams.
Mrs. H. H. Smith	Sacramento	Five cone worked wall pockets.
Mrs. H. H. Smith	Sacramento	Two cone worked hanging baskets.
Mrs. H. H. Smith	Sacramento	One cone worked church bank.
Mrs. E. Katzenstein	Sacramento	General display of millinery goods.
Mrs. E. Katzenstein	Sacramento	One velvet bonnet.
Mrs. E. Katzenstein	Sacramento	One velvet hat.
Mrs. E. Katzenstein	Sacramento	One silk bonnet.
Mrs. E. Katzenstein	Sacramento	Display of feathers.
Mrs. E. Katzenstein	Sacramento	Display of artificial flowers.
Mrs. B. F. Tade	Sacramento	One worked quilt.
Miss Alice Parker	Sacramento	One basket wax flowers.
Miss Alice Parker	Sacramento	One bunch feather flowers.
Miss N. Montfort	Sacramento	Two pieces of linen embroidery.
Miss N. Montfort	Sacramento	One embroidered ladies' dress.
Miss N. Montfort	Sacramento	One embroidered handkerchief.
Miss N. Montfort	Sacramento	Three pieces of linen embroidery.
Miss N. Montfort	Sacramento	One piece of braid work.
Miss May Hubbard	San Francisco	Five pieces of linen embroidery.
Mrs. T. Flynn	Sacramento	One knit bedspread.
Mrs. J. Swoolman	Sacramento	One knit quilt, hand-made.
Miss M. G. Hoyle	Sacramento	One necklace made of fish scales.
Mrs. N. D. Goodell	Sacramento	One knit foot-rug.
Mrs. N. D. Goodell	Sacramento	One tidy in crewel work.
Mrs. F. W. Hicks	Sacramento	One worsted sofa cushion.
Mrs. F. W. Hicks	Sacramento	Two chenille embroidered toilet cushions.
Mrs. F. W. Hicks	Sacramento	One fine crochet collar.
Mrs. James R. Lawrie	Santa Clara	One child's afghan.
Dale & Co.	Sacramento	One embroidered picture.
Mrs. James R. Lawrie	Santa Clara	Four embroidered handkerchiefs.
Mrs. James R. Lawrie	Santa Clara	One toilet set, five pieces.
Mrs. Wm. Eberhardt	Sacramento	One silk worked piano cover.
S. J. Nathan & Co.	Sacramento	One satin lined overcoat.
S. J. Nathan & Co.	Sacramento	One Prince Albert coat and vest.
S. J. Nathan & Co.	Sacramento	Eight frock coats and vests.
S. J. Nathan & Co.	Sacramento	Five sack coats and vests.
S. J. Nathan & Co.	Sacramento	Thirteen pairs French cashmere and worsted pants.
S. J. Nathan & Co.	Sacramento	Seven white and colored Summer vests.
S. J. Nathan & Co.	Sacramento	Two ulsters.
S. J. Nathan & Co.	Sacramento	One dressing gown.
S. J. Nathan & Co.	Sacramento	Nine full suits of boys' clothing.
Minnie B. Cross	Woodland	Twelve specimens of point lace.
Locke & Lavenson	Sacramento	Display of lambrequins.
Henry Fisher	Sacramento	One moss and cloth picture.
Mrs. G. W. Combs	Sacramento	Four pieces of fine lace work.
Mrs. G. W. Combs	Sacramento	One piece of Kensington embroidery.
Mrs. O. C. Howe	Sacramento	One crochet afghan.
Mrs. C. H. Cummings	Sacramento	One knit afghan.
Mrs. R. Davenport	Brighton	Fourteen rag hearth rugs.
Mrs. F. Thoss	Nevada City	One crochet table cover.
Mrs. F. Thoss	Nevada City	One hand-knit table cover.
Mrs. F. Thoss	Nevada City	One crochet tidy.
Mrs. F. Thoss	Nevada City	Two knit tidies.

Class III.—Needle, Shell, Wax Work, etc.—Continued.

Exhibitor.	Residence.	Article.
Mrs. F. Thoss	Nevada City	Six pairs knit ladies hose.
Mrs. F. Thoss	Nevada City	Seven pairs knit children's stockings, woolen.
Mrs. F. Thoss	Nevada City	Eight pairs knit children's stockings, cotton.
Mrs. F. Thoss	Nevada City	Two pairs knit mittens.
Mrs. F. Thoss	Nevada City	One pair hand knit lace stockings.
Mrs. F. Thoss	Nevada City	Five pairs knit socks.
Mrs. F. Thoss	Nevada City	Two pairs knit leggings.
Mrs. L. N. Billings	Sacramento	One bedspread.
Mrs. Sarah Rhorer	Sacramento	One knit quilt.
Mrs. J. N. Porter	Sacramento	One ottoman cover.
Mrs. J. N. Porter	Sacramento	One table cover.
Mrs. J. N. Porter	Sacramento	One chair stripe in crewel work.
Mrs. J. N. Porter	Sacramento	One sofa cushion.
Mrs. J. N. Porter	Sacramento	Two pieces of outline embroidery.
Mrs. J. N. Porter	Sacramento	One embroidered dressing gown.
Mrs. J. N. Porter	Sacramento	One bedspread and pair of pillow shams.
Mrs. J. N. Porter	Sacramento	One hand-made lace curtain.
Mrs. W. A. Houghton	Sacramento	One embroidered table cover.
Mrs. W. A. Houghton	Sacramento	One crochet shawl.
Mrs. W. A. Houghton	Sacramento	Two lambrequins.
Mrs. W. A. Houghton	Sacramento	One chenille tidy.
Mrs. W. A. Houghton	Sacramento	One silk and crewel embroidered wall panel.
Misses Brothers	Sacramento	General display of millinery goods.
Misses Brothers	Sacramento	General display of feathers.
Misses Brothers	Sacramento	General display of artificial flowers.
Misses Brothers	Sacramento	One velvet bonnet.
Misses Brothers	Sacramento	One velvet hat.
Misses Brothers	Sacramento	One silk bonnet.
Miss C. R. Brothers	Sacramento	One embroidered sofa cushion.
Miss C. R. Brothers	Sacramento	One embroidered pincushion.
Miss C. R. Brothers	Sacramento	Three pieces of hand-made point lace.
Miss C. R. Brothers	Sacramento	One point lace handkerchief.
Mrs. Wightman	Sacramento	Display of ornamental needlework.
Mrs. Wightman	Sacramento	One toilet set, cushion and covered bottles.
Mrs. Miller	Sacramento	One fine white bedspread.
Mrs. J. N. Porter	Sacramento	One pair crochet mats.
Mrs. J. N. Porter	Sacramento	Display crochet work.
Miss Belle Felter	Sacramento	Two Kensington embroidered table covers.
Miss Belle Felter	Sacramento	Three Kensington embroidered tidies.
Miss Belle Felter	Sacramento	One Kensington embroidered bag.
Miss Belle Felter	Sacramento	Six Kensingson embroidered doilies.
Miss Belle Felter	Sacramento	Two silk embroidered skirts.
Miss Belle Felter	Sacramento	One pair embroidered lamp-stand mats.
Miss Belle Felter	Sacramento	One chenille worked ottoman cover.
Miss Belle Felter	Sacramento	Two chenille worked chair stripes.
Miss Belle Felter	Sacramento	One chenille worked sofa cushion.
Miss Belle Felter	Sacramento	One outline embroidery tidy.
Miss Belle Felter	Sacramento	One crewel worked tidy.
Miss Belle Felter	Sacramento	One chenille worked tidy.
Miss Belle Felter	Sacramento	Three chenille worked fancy boxes.
Miss Belle Felter	Sacramento	One chenille embroidered chair.
Miss Belle Felter	Sacramento	One lace tidy.
Miss Belle Felter	Sacramento	One complete toilet set, thirteen pieces.
Mrs. R. L. Holman	Sacramento	Two hearth rugs.
Mrs. R. L. Holman	Sacramento	Four tidies—two crocheted, two canvas.
Mrs. R. L. Holman	Sacramento	One worsted crochet stand cover.
Mrs. R. L. Holman	Sacramento	One silk sofa pillow.
Mrs. R. L. Holman	Sacramento	One canvas work pincushion.
Mrs. R. L. Holman	Sacramento	One towel rack.
Mrs. R. O. Cravens	Sacramento	One crochet shawl.
Miss Anna Benedict	Oakland	One child's afghan.
Mrs. R. L. Holman	Sacramento	One wool and canvas motto.
Miss Maggie Hayes	Sacramento	Starr's system of dress cutting, square measurement.
Mrs. E. B. Hunt	Sacramento	One hand-knit bedspread.
May C. Bugess	Sacramento	Display of ornamental needlework.

Class III.—Needle, Shell, Wax Work, etc.—Continued.

Exhibitor.	Residence.	Article.
Mrs. F. C. Neal	Sacramento	One patchwork quilt.
Mrs. F. C. Neal	Sacramento	One masonic quilt.
Mrs. F. C. Neal	Sacramento	One log cabin quilt.
Mrs. E. B. Hunt	Sacramento	One log cabin quilt.
Capitol Woolen Mills	Sacramento	Display of men's clothing.
Miss Addie Wells	Sacramento	One Java canvas toilet set, four pieces.
Miss Addie Wells	Sacramento	One macrame lace satchel.
Miss Addie Wells	Sacramento	One macrame lace basket lambrequin.
Miss Addie Wells	Sacramento	One worsted butterfly.
Mrs. F. P. Lowell	Sacramento	One handknit piano stool cover.
Miss Eugenia Excoffier	San Francisco	One wreath wax flowers.
Miss Eugenia Excoffier	San Francisco	Display of hair jewelry.
Miss Eugenia Excoffier	San Francisco	Display of tatting.
Miss Eugenia Excoffier	San Francisco	Display of crotchet work.
Miss Eugenie Excoffier	San Francisco	One cushion and mat of darned work.
Miss Belle Felter	Sacramento	One silk embroidered pen-wiper.
Mrs. H. H. Pierson	Sacramento	One bunch skeleton leaves.
Mrs. H. H. Pierson	Sacramento	One bunch wax Autumn leaves.
Mrs. H. H. Pierson	Sacramento	One embroidered and beaded lambrequin.
Miss Eugenia Excoffier	San Francisco	One wreath hair flowers.
Miss Stella Whitman	San Francisco	One bedspread and pair pillow shams.
Mrs. T. L. Acock	Sacramento	One silk log cabin quilt.
Miss Eugenia Excoffier	San Francisco	One apron of tape and crotchet work.
Mrs. M. A. Hunter	Shingle Springs	One knit bedspread (one year's work).
Mrs. E. Doolittle	San Rafael	One knit quilt.
Mrs. G. T. Bascom	Sacramento	One hearth rug.
Mrs. W. A. Houghton	Sacramento	One toilet set and bureau scarf.
Mrs. M. M. Sickler	San Diego	One point lace collar and pair of cuffs.

CLASS V.—LIBERAL ARTS.

PRINTING, LITHOGRAPHING, ETC.

M. Ostrom	Sacramento	One portrait medallion.
T. B. Johnson	San Francisco	Display plain and ornamental penmanship.
J. L. Lesser	Sacramento	General display of card printing.
Andrew Clunie	Sacramento	General display of card printing.
Dale & Co.	Sacramento	Display of sheet music printed in California.

FOURTH DEPARTMENT.

CLASS I.—LEATHER, RUBBER, AND PAPER.

Exhibitor.	Residence.	Article.
J. Sullivan	Sacramento	One dozen California tanned calfskins.
John Utschig	San Francisco	One pair dress boots.
John Utschig	San Francisco	One pair heavy boots.
John Utschig	San Francisco	One pair gent's dress shoes.
John Utschig	San Francisco	One pair Congress gaiters.
John Utschig	San Francisco	One pair ladies' slippers.
John Utschig	San Francisco	One pair ladies' gaiters.
John Utschig	San Francisco	One pair ladies' bootees.
John Utschig	San Francisco	And general display of ladies' and gentlemen's boots and shoes.

Class I.—Leather, Rubber, and Paper—Continued.

Exhibitor.	Residence.	Article.
Main & Winchester	San Francisco	One set silver-mounted double harness, hack, California manufacture.
Main & Winchester	San Francisco	One set silver-mounted double harness, carriage.
Main & Winchester	San Francisco	One set gold-mounted double harness, carriage.
Main & Winchester	San Francisco	Two sets silver-mounted d'ble harness, buggy.
Main & Winchester	San Francisco	Two sets gold-mounted d'ble harness, buggy.
Main & Winchester	San Francisco	One set gold-mounted single harness, coupé.
Main & Winchester	San Francisco	One set silver-mounted single harness, coupé.
Main & Winchester	San Francisco	One set silver-mounted single harness, express.
Main & Winchester	San Francisco	One set silver-mounted single harness, truck.
Main & Winchester	San Francisco	One set gold-mounted single harness, truck.
Main & Winchester	San Francisco	One set gold-mounted single harness, buggy.
Main & Winchester	San Francisco	One set silver-mounted single harness, buggy.
Main & Winchester	San Francisco	One silver-mounted Mexican saddle.
Main & Winchester	San Francisco	One Texas rangers' saddle.
Main & Winchester	San Francisco	Three gents' riding saddles.
Main & Winchester	San Francisco	Four race saddles.
Main & Winchester	San Francisco	One quilted-seat ladies' saddle.
Main & Winchester	San Francisco	One gents' English saddle.
Main & Winchester	San Francisco	One Mexican rangers' saddletree.
Main & Winchester	San Francisco	Sixteen vaqueros saddletrees.
Main & Winchester	San Francisco	Two race saddletrees.
Main & Winchester	San Francisco	One ladies' side Mexican saddletree.
Main & Winchester	San Francisco	Fourteen rawhide riding bridles.
Main & Winchester	San Francisco	Nine calfskin headstalls.
Main & Winchester	San Francisco	Three buckskin headstalls.
Main & Winchester	San Francisco	Three race bridles.
Main & Winchester	San Francisco	Twenty-four Mexican bridles.
Main & Winchester	San Francisco	Eighteen riding bridles.
Main & Winchester	San Francisco	Eighteen Mexican bridles, rawhide reins.
Main & Winchester	San Francisco	Three hair bridles.
Main & Winchester	San Francisco	Two rawhide hitching reins.
Main & Winchester	San Francisco	Forty-two rawhide riding reins.
Main & Winchester	San Francisco	Eighteen pairs calf riding reins.
Main & Winchester	San Francisco	Five pairs buckskin riding reins.
Main & Winchester	San Francisco	Three pairs buckskin martingales.
Main & Winchester	San Francisco	Twenty pairs hair riding reins.
Main & Winchester	San Francisco	Thirty hair ropes.
Main & Winchester	San Francisco	Six hair hackamoors.
Main & Winchester	San Francisco	Twenty-four rawhide hackamoors.
Main & Winchester	San Francisco	Four rawhide riatas.
Main & Winchester	San Francisco	One dozen horse collars.
Main & Winchester	San Francisco	Four fly nets.
Main & Winchester	San Francisco	One set of team bells.
Main & Winchester	San Francisco	One pair of chaperajoes.
Main & Winchester	San Francisco	Six hair cinches.
Main & Winchester	San Francisco	Two muzzles.
Main & Winchester	San Francisco	One hundred assorted interfering boots.
Main & Winchester	San Francisco	One pair of silver mounted truck hames.
Main & Winchester	San Francisco	One pair of spur leathers.
Main & Winchester	San Francisco	Twelve gents' saddle cloths.
Main & Winchester	San Francisco	Six ladies' saddle cloths.
Main & Winchester	San Francisco	One horse suit, two pairs of blankets and hood, fine wool.
Main & Winchester	San Francisco	Four horse blankets.
Main & Winchester	San Francisco	Two horse blankets.
Main & Winchester	San Francisco	One cooling blanket.
Main & Winchester	San Francisco	Twenty-seven fine wool lap robes.
Main & Winchester	San Francisco	One sealskin lap robe.
Main & Winchester	San Francisco	One bearskin lap robe.
Main & Winchester	San Francisco	One white fox lap robe.
Main & Winchester	San Francisco	One wolfskin lap robe.
Main & Winchester	San Francisco	One dozen rawhide riding whips.

Class I.—Leather, Rubber, and Paper—Continued.

Exhibitor.	Residence.	Article.
Main & Winchester	San Francisco	Two gold mounted ivory handle buggy whips.
Main & Winchester	San Francisco	Sixty-four gold mounted buggy whips.
Main & Winchester	San Francisco	One hundred and eight silver mounted buggy whips.
Main & Winchester	San Francisco	Two hundred assorted buggy whips.
Main & Winchester	San Francisco	Six blacksnake whips.
Main & Winchester	San Francisco	Twelve stock whips.
Main & Winchester	San Francisco	Twelve dog whips.
Main & Winchester	San Francisco	Twenty-five gold mounted ivory handle riding whips.
Main & Winchester	San Francisco	Twenty-six silver mounted ivory handle riding whips.
Main & Winchester	San Francisco	Six hundred assorted riding whips.
Main & Winchester	San Francisco	Six gold mounted sulky whips.
Main & Winchester	San Francisco	Six silver mounted sulky whips.
Main & Winchester	San Francisco	Twelve hack whips.
Main & Winchester	San Francisco	Twelve assorted buckskin lashes.
Main & Winchester	San Francisco	Six ox lashes.
C. Nelson	Sacramento	Four Mexican saddles.
C. Nelson	Sacramento	One case of Mexican bits and spurs.
C. Nelson	Sacramento	Six saddletrees.
James Parsons	Sacramento	Display of ladies' fine shoes, slippers, and sandals.
Weinstock & Lubin	Sacramento	General display of dress shoes.
Weinstock & Lubin	Sacramento	General display of ladies' slippers.
Weinstock & Lubin	Sacramento	General display of ladies' gaiters.
Weinstock & Lubin	Sacramento	General display of men's boots and shoes.
Weinstock & Lubin	Sacramento	General display of boys' boots and shoes.
Weinstock & Lubin	Sacramento	General display of leather gloves and mittens.
Weinstock & Lubin	Sacramento	General display of soft hats.
S. J. Nathan & Co.	Sacramento	Two brown-fitted Pellesier satchels.
S. J. Nathan & Co.	Sacramento	Two XXX Blackstone satchels.
S. J. Nathan & Co.	Sacramento	Two XXX Gladstone satchels.
S. J. Nathan & Co.	Sacramento	Four XXX Belgian Imperial satchels.
S. J. Nathan & Co.	Sacramento	Four Sacramento Pellesier satchels.
S. J. Nathan & Co.	Sacramento	Ten assorted brown and black satchels.
S. J. Nathan & Co.	Sacramento	Six sole leather valises.
S. J. Nathan & Co.	Sacramento	Ten tourists' straps.
S. J. Nathan & Co.	Sacramento	Twenty-three shawl straps.
S. J. Nathan & Co.	Sacramento	Three Eugenia leather-covered trunks.
S. J. Nathan & Co.	Sacramento	Three French-top Saratogas.
S. J. Nathan & Co.	Sacramento	Three gents' Brighton Beach trunks.
S. J. Nathan & Co.	Sacramento	Two carpet bags.

CLASS II.—WORKED METALS.

Main & Winchester	San Francisco	General display of saddlers' hardware.
Scott & Muir	Sacramento	General display of gas fixtures and lamps.
L. L. Lewis & Co.	Sacramento	General display of copper work.
L. L. Lewis & Co.	Sacramento	General display of tinware.
Z. Fetterby	Yolo	One patent beer tap.
W. K. Vanderslice	San Francisco	General display of silverware.
George T. Bush	Sacramento	General display of copper work.
George T. Bush	Sacramento	General display of brass work.
George T. Bush	Sacramento	General display of plumbers' goods and wares.
George T. Bush	Sacramento	General display of chandeliers and burners.
George T. Bush	Sacramento	General display of lamps.
George T. Bush	Sacramento	General display of bathing tubs.
George E. Duden	Lake House	Six pairs pruning shears.
G. W. Shreeve	San Francisco	General display of worked iron and steel.
G. W. Shreeve	San Francisco	General display of engraving on steel.
G. W. Shreeve	San Francisco	General display of shot.

CLASS III.—STOVES, CASTINGS, ETC.

Exhibitor.	Residence.	Article.
Capital Gas Works	Sacramento	A model of the Capital Gas Works.
Capital Gas Works	Sacramento	General display of gas stoves.
L. L. Lewis & Co.	Sacramento	General display wood burning cooking stoves.
L. L. Lewis & Co.	Sacramento	General display coal burning cooking stoves.
L. L. Lewis & Co.	Sacramento	One parlor stove.
L. L. Lewis & Co.	Sacramento	One cooking range.
L. L. Lewis & Co.	Sacramento	General display of hollow iron ware.
L. L. Lewis & Co.	Sacramento	General display of ornamental statuary.
L. L. Lewis & Co.	Sacramento	General display of ornamental fruit and flower stands.
L. L. Lewis & Co.	Sacramento	One portable cooking range.
Aitken & Fish	Sacramento	One hot-air parlor grate.

CLASS IV.—MUSICAL INSTRUMENTS.

L. K. Hammer	Sacramento	Four Chickering pianos (three upright, one square).
L. K. Hammer	Sacramento	Four Wilcox & White organs.
DeYoe & Riggs	Sacramento	Four parlor organs.
DeYoe & Riggs	Sacramento	One chapel organ.
DeYoe & Riggs	Sacramento	One Fisher upright piano.
Dale & Co.	Sacramento	General display musical instruments.
Sherman, Hyde & Co.	San Francisco	Two upright pianos, California manufacture.
Sherman, Hyde & Co.	San Francisco	One upright piano, Haines Bros. manufacture.
Sherman, Hyde & Co.	San Francisco	One square grand piano, Weber manufacture.
Sherman, Hyde & Co.	San Francisco	Three Estey organs.
Sherman, Hyde & Co.	San Francisco	Three organetts.
T. M. Antisell & Co.	San Francisco	One extra square grand piano.
T. M. Antisell & Co.	San Francisco	One square grand parlor piano.
T. M. Antisell & Co.	San Francisco	Two cabinet grand uprights.
T. M. Antisell & Co.	San Francisco	One parlor upright piano.
T. M. Antisell & Co.	San Francisco	Three organs.
John T. Cooper	Sacramento	General display of musical instruments.

CLASS V.—FURNITURE.

The J. M. Brunswick & Balke Company	San Francisco	General exhibition table, 5x10.
The J. M. Brunswick & Balke Company	San Francisco	Monarch table, 4½x9.
The J. M. Brunswick & Balke Company	San Francisco	Parlor table, 3½x7.
Gilbert & Moore	San Francisco	General display school furniture.
Gilbert & Moore	San Francisco	General display office desks.
J. G. Davis	Sacramento	One set parlor furniture.
J. G. Davis	Sacramento	One sofa.
J. G. Davis	Sacramento	One set parlor chairs.
J. G. Davis	Sacramento	One sick chair.
J. G. Davis	Sacramento	One office desk.
J. G. Davis	Sacramento	One bookcase.
J. G. Davis	Sacramento	One writing desk.
J. G. Davis	Sacramento	Display of upholstery.
J. G. Davis	Sacramento	General display of furniture.
J. G. Davis	Sacramento	Five Turkish chairs.

CLASS V.—FURNITURE—Continued.

Exhibitor.	Residence.	Article.
J. G. Davis	Sacramento	One reception chair.
J. G. Davis	Sacramento	One patent rocker.
J. G. Davis	Sacramento	Two bay window chairs.
J. G. Davis	Sacramento	One music stand.
C. H. Larabee	Sacramento	One spring bed.
Pacific Spring & Mattress Co.	San Francisco	One dressing bureau.
Pacific Spring & Mattress Co.	San Francisco	Display of furniture California manufacture.
Pacific Spring & Mattress Co.	San Francisco	Display of mattresses.
Pacific Spring & Mattress Co.	San Francisco	Display of spring beds.
Pacific Spring & Mattress Co.	San Francisco	Two sets of bedroom furniture.
John Cordane	Sacramento	One fancy box made entirely with a penknife.
William Eberhardt	Sacramento	Display of California woods.
B. F. Farrar	San Francisco	Three double butt ne plus ultra spring beds.
B. F. Farrar	San Francisco	One single butt ne plus ultra spring bed.
B. F. Farrar	San Francisco	Three economist slat spring beds.
B. F. Farrar	San Francisco	One ne plus ultra spring bed mattress.
B. F. Farrar	San Francisco	Two economist spring bed mattresses.
B. F. Farrar	San Francisco	One skeleton spring bed mattress.
B. F. Farrar	San Francisco	Two top hair mattresses in sections.
B. F. Farrar	San Francisco	Two common top hair mattresses.
Geo. H. Fuller	San Francisco	Eighteen school desks.
Geo. H. Fuller	San Francisco	Two folding settees.
Geo. H. Fuller	San Francisco	One recitation chair.
Geo. H. Fuller	San Francisco	Three store stools.
Geo. H. Fuller	San Francisco	One teacher's table.
Geo. H. Fuller	San Francisco	One globe.
Geo. H. Fuller	San Francisco	One Mattleck's tellurion.
Haywood & Co.	San Francisco	Two rattan sofas.
Haywood & Co.	San Francisco	One rattan center table.
Haywood & Co.	San Francisco	One rattan work basket.
Haywood & Co.	San Francisco	One rattan music rack.
Haywood & Co.	San Francisco	Fourteen rattan chairs.
Truman S. Clark & Co.	San Francisco	One folding parlor bed with bedding.
Truman S. Clark & Co.	San Francisco	One invalid chair and couch.
Truman S. Clark & Co.	San Francisco	One spring mattress.
Truman S. Clark & Co.	San Francisco	Four iron gaspipe bedsteads with spring attachment.
Mrs. J. Kindleberger	San Francisco	One pillow-sham holder.
J. H. Archer	Madison	One patent invalid bed.
John Breuner	Sacramento	One walnut frame sofa, crimson velours.
John Breuner	Sacramento	One walnut frame lounge in raw silk.
John Breuner	Sacramento	One office chair in leather, walnut frame.
John Breuner	Sacramento	One walnut frame set parlor chairs, in crimson.
John Breuner	Sacramento	One walnut inlaid center table.
John Breuner	Sacramento	One pair walnut and gilt side tables.
John Breuner	Sacramento	One set parlor furniture, inlaid frame.
John Breuner	Sacramento	One walnut bookcase.
John Breuner	Sacramento	One walnut wardrobe.
John Breuner	Sacramento	One walnut frame sick chair, in east lake tapestry.
John Breuner	Sacramento	One walnut double office desk.
John Breuner	Sacramento	One walnut frame parlor set in silk, cashmere, plush.
John Breuner	Sacramento	One walnut divan in brown velours.
John Breuner	Sacramento	One frame divan in brown and blue satin.
John Breuner	Sacramento	One Turkish chair in crimson velours.
John Breuner	Sacramento	One bed lounge in spun silk.
John Breuner	Sacramento	One walnut frame bed chair in spun silk.
John Breuner	Sacramento	One gilt frame fancy chair in brown satin.
Pacific Spring & Mattress Co.	San Francisco	Display of California woods.
S. P. Sorrenson	Rio Vista	Sorrenson's patent chair brace.
J. Breuner	Sacramento	General display of furniture.
J. Breuner	Sacramento	General display of upholstery.

CLASS VI.—WOODENWARE.

Exhibitor.	Residence.	Article.
Billingsly & Co.	Sacramento	Display of cedar ware.
Billingsly & Co.	Sacramento	Display of pine ware.
Billingsly & Co.	Sacramento	Display of oak ware.
Billingsly & Co.	Sacramento	Display of willow ware.
Billingsly & Co.	Sacramento	Display of splintwood baskets.
Billingsly & Co.	Sacramento	Display of osier willow.
Billingsly & Co.	Sacramento	Display of brooms, broom corn, and brushes.
Billingsly & Co.	Sacramento	Display of wooden ware.
Edw. H. Krause	Sacramento	Display of scroll sawing.
William Eberhardt	Sacramento	Display of oak ware.
William Eberhardt	Sacramento	Display of turning work.
William Eberhardt	Sacramento	Display of carving.
William Eberhardt	Sacramento	Display of ivory work.
Dale & Co.	Sacramento	Display of willow ware.

CLASS VII.—MISCELLANEOUS.

Pulvermacher Galvanic Co.	San Francisco	One case of electric belts, bands, etc.
W. O. Thrailkill	Sacramento	Display of dental goods and instruments.
W. O. Thrailkill	Sacramento	One cabinet of dental goods.
George W. Shreve	San Francisco	Two game bags, California manufacture.
George W. Shreve	San Francisco	One double-barrel shotgun, Cal. man.
George W. Shreve	San Francisco	One breach-loading shotgun, Cal. man.
George W. Shreve	San Francisco	One sporting rifle, Cal. man.
George W. Shreve	San Francisco	Display of firearms, Cal. man.
George W. Shreve	San Francisco	Display of firearms, American man.
George W. Shreve	San Francisco	Display of fishing tackle.
California Elastic Truss Co.	San Francisco	General display of modern improved elastic trusses.
Electro-Magnetic Belt Co.	San Francisco	General display of galvanic belts.
William Eberhardt	Sacramento	Four breach-loading double-barrel shotguns, California manufacture.
William Eberhardt	Sacramento	One double-barrel sporting rifle, Cal. man.
William Eberhardt	Sacramento	General display of firearms.
R. H. Fisk	Sacramento	One electric machine.
R. H. Fisk	Sacramento	One electric telegraph instrument.
R. H. Fisk	Sacramento	One galvanic battery and apparatus.

CLASS VIII.—CHEMICALS.

Whittier, Fuller & Co.	Sacramento	Display of Prussian blue.
Whittier, Fuller & Co.	Sacramento	Display of copal varnish.
Whittier, Fuller & Co.	Sacramento	Display of glue.
Whittier, Fuller & Co.	Sacramento	Display of castor oil.
Whittier, Fuller & Co.	Sacramento	Five gallons linseed oil.
Whittier, Fuller & Co.	Sacramento	Display of white lead.
Whittier, Fuller & Co.	Sacramento	Five gallons of lard oil.
Whittier, Fuller & Co.	Sacramento	Display of lubricating petroleum.
Whittier, Fuller & Co.	Sacramento	Display of illuminating petroleum.
Whittier, Fuller & Co.	Sacramento	Display of paints of California manufacture.
B. B. Scott & Son	Sacramento	Display of yeast cake.
B. B. Scott & Son	Sacramento	Display of writing fluid.
B. B. Scott & Son	Sacramento	Display of flavoring extracts.
C. C. Burr & Co.	San Francisco	Samples of mustards and spices.
C. C. Burr & Co.	San Francisco	Samples of salad oil.
C. C. Burr & Co.	San Francisco	Samples of baking powder.
C. C. Burr & Co.	San Francisco	Samples of cream tartar.

CLASS VIII.—CHEMICALS—Continued.

Exhibitor.	Residence.	Article.
C. C. Burr & Co.	San Francisco	Samples of nutrient phosphate and sugar of malt.
C. W. Rapp & Co.	Sacramento	Eighteen cases of Bossilleer's yeast powder.
C. W. Rapp & Co.	Sacramento	Eighty boxes of Japan tea.
Withington & Bagley	Sacramento	General display of fancy and common soap.
Withington & Bagley	Sacramento	General display of bleaching soap.
Adams, McNiel & Co.	Sacramento	Display of royal baking powder.

CLASS IX.—CROCKERY, ETC.

Henry Fisher	Sacramento	Twenty-five jars of candy.
Henry Fisher	Sacramento	Three pans of candy.
Henry Fisher	Sacramento	One showcase of candy.
Henry Fisher	Sacramento	One showcase of cakes.
Henry Fisher	Sacramento	Three cases of ornamental cakes.
Henry Fisher	Sacramento	Three cases of fancy confectionery.
W. F. Peterson	Sacramento	Twenty-five jars of candy.
W. F. Peterson	Sacramento	Two cases of confectionery.
W. F. Peterson	Sacramento	One case of candy.
W. F. Peterson	Sacramento	Eight fancy figures and baskets.
Hobby & Smith	Sacramento	Display of Rockingham ware.
Hobby & Smith	Sacramento	Display of stone ware.
Hobby & Smith	Sacramento	Samples of drain tile.
Hobby & Smith	Sacramento	Samples of terra cotta.
Hobby & Smith	Sacramento	Samples of fire brick.
Hobby & Smith	Sacramento	Samples of pottery of various kinds.
Billingsly & Co.	Sacramento	Display of demijohns.
Billingsly & Co.	Sacramento	Display of glassware.
Whittier, Fuller & Co.	Sacramento	Display of looking-glass.
Whittier, Fuller & Co.	Sacramento	Display of stained glass.
Whittier, Fuller & Co.	Sacramento	Display of ground glass.
Terrence Duffy	San Francisco	Display of stone ware.
Terrence Duffy	San Francisco	Collection of live fish.
Terrence Duffy	San Francisco	Display of ornamental statuary.
Terrence Duffy	San Francisco	Display of ornamental flower stands.

CLASSES X AND XI.—MINERALS, ETC.

Edward H. Krause	Sacramento	Display of native woods and grasses of California.
H. C. Megerlie	Sacramento	Display representing the ornithology of California.
H. C. Megerlie	Sacramento	Display of native grasses of California.
Aitken & Fish	Sacramento	Collection of polished California marble work.
Aitken & Fish	Sacramento	One carved marble mantel.

FIFTH DEPARTMENT.

CLASS I.—SILK, COTTON, AND TOBACCO.

Exhibitor.	Residence.	Article.
Geo. Spiker	Sacramento	Display of Turkish tobacco, Cal. production.
Geo. Spiker	Sacramento	Display of Latakia tobacco, Cal. production.
Geo. Spiker	Sacramento	Display of Orinoco tobacco, Cal. production.
Geo. Spiker	Sacramento	Display of Havana tobacco, Cal. production.
Geo. Spiker	Sacramento	Display of Silky Pryor tobacco, Cal. production.
Geo. Spiker	Sacramento	Display of Pfabzer tobacco, Cal. production.
Geo. Spiker	Sacramento	Display of Ampalama tobacco, Cal. production.
Geo. Spiker	Sacramento	One box Orinoco smoking tobacco, Cal. production.
Geo. Spiker	Sacramento	One box French cut tobacco, Cal. production.
Geo. Spiker	Sacramento	One box Natural Leaf tobacco, Cal. production.
Geo. Spiker	Sacramento	One box seed tobacco.
Geo. Spiker	Sacramento	Six tobacco plants.
S. Tryon	Sacramento	California cotton.
Geo. Spiker	Sacramento	Three bundles plantation cigars, Cal. manufacture.
Geo. Spiker	Sacramento	Two bundles Swiss cigars, Cal. manufacture.
Geo. Spiker	Sacramento	Seven bundles cigars, Cal. manufacture.

CLASS II.—FLOUR AND GRAIN.

A. B. Gilbert	Brighton	One bushel of yellow corn.
A. B. Gilbert	Brighton	One bushel of white corn.
A. B. Gilbert	Brighton	One bushel of early corn.
G. W. Hallow	Brighton	One sack Iowa blue stem wheat.
L. L. Moulton	Colusa	One variety red Sonora wheat.
L. L. Moulton	Colusa	One variety propo wheat.
L. L. Moulton	Colusa	One variety blue stone wheat.
L. L. Moulton	Colusa	One variety white Sonora wheat.
L. L. Moulton	Colusa	One variety Wills early club wheat.
L. L. Moulton	Colusa	One variety Danish wheat.
L. L. Moulton	Colusa	One variety white fozel wheat.
L. L. Moulton	Colusa	One variety Genesee wheat.
L. L. Moulton	Colusa	One variety old club wheat.
Lehman & Flint	Sacramento	One bale hops.
A. Mouton	Sacramento	One bale hops.
O. O. Lovedale	Sacramento	One bale hops.
Dan. Flint	Sacramento	Two bales of hops.
M. Waterman & Co	Sacramento	Three samples of imported Australian wheat.
A. D. Miller	Sacramento	Six samples wheat in head.
A. D. Miller	Sacramento	One bushel white corn.
A. D. Miller	Sacramento	One bushel early corn.
A. D. Miller	Sacramento	One sample of East India millet.
A. D. Miller	Sacramento	One sample of sorghum sugar cane.
H. Cronkite	Walsh's Station	One sample white Chili wheat.
H. Cronkite	Walsh's Station	One sample white Tuscany wheat.
H. Cronkite	Walsh's Station	One sample Waterloo oats.
H. Cronkite	Walsh's Station	One sample East India millet in stacks.
Don Juan Foster	San Diego	One sample of wheat grown on his ranch.
A. J. Steiner	Woodland	Sample of Pride of Butte wheat, 3,584 lbs. to an acre.
A. J. Steiner	Woodland	Sample of Patent Office wheat, 2,899 lbs. to an acre.

Class II.—Flour and Grain—Continued.

Exhibitor.	Residence.	Article.
Mertie Dixon	Woodland	Display of garden seeds.
G. W. Colby	Nord	One sack propo wheat.
G. W. Colby	Nord	One sack Australian wheat.
G. W. Colby	Nord	One sack club wheat.
G. W. Colby	Nord	One sack Sonora wheat.
John Bidwell	Chico	One sack California white wheat.
John Bidwell	Chico	One sack California Chili wheat.
John Bidwell	Chico	One sack California Tuscan wheat.
John Bidwell	Chico	One sack California Winter gold dust wheat.
John Bidwell	Chico	One sack California macaroni wheat.
John Bidwell	Chico	One sack California silver chaff wheat.
John Bidwell	Chico	One sack California propo wheat.
John Bidwell	Chico	One sack California Genesee wheat.
John Bidwell	Chico	One sack California white club wheat.
John Bidwell	Chico	One sack California Australian wheat.
John Bidwell	Chico	One sack California Australian wheat, blue stem.
John Bidwell	Chico	One sack California Champlain wheat.
John Bidwell	Chico	One sack California defiance wheat.
John Bidwell	Chico	One sack California Molds red winter wheat.
John Bidwell	Chico	One sack California Odessa wheat.
John Bidwell	Chico	One sack California new prolific wheat.
John Bidwell	Chico	One sack California Pride of Butte wheat.
John Bidwell	Chico	One sack California red (nameless) wheat.
John Bidwell	Chico	Thirteen bundles California wheat.
John Bidwell	Chico	Three samples California Mexican barley.
John Bidwell	Chico	Three samples California Irish barley.
John Bidwell	Chico	Three samples California Nepol barley, bald.
John Bidwell	Chico	One variety white oats.
John Bidwell	Chico	One variety rye oats.
John Bidwell	Chico	One sack white Egyptian corn.
John Bidwell	Chico	One box white Egyptian corn in heads.
John Bidwell	Chico	One box red Egyptian corn in heads.
John Bidwell	Chico	One hundred pounds XXX baker's flour.
John Bidwell	Chico	Two boxes Wilson Indian corn.
John Bidwell	Chico	Two boxes large yellow Dent corn.
John Bidwell	Chico	Two boxes large yellow field corn.
John Bidwell	Chico	One box large white Dent corn.
John Bidwell	Chico	One box Runner's prolific wheat.
L. L. Moulton	Colusa	Nine varieties of wheat in heads.

CLASS III.—VEGETABLES, ROOTS, ETC.

A. B. Gilbert	Brighton	Six marrow squashes.
A. B. Gilbert	Brighton	One crookneck squash.
A. B. Gilbert	Brighton	One pumpkin.
A. B. Gilbert	Brighton	Twelve sweet green corn.
A. B. Gilbert	Brighton	Three mountain sweet watermelons.
Wilson Hatch	Virginia City	One sample of white potatoes.
F. Bable	Sacramento	Six cucumbers.
A. L. Tryon	Sacramento	Six sugar beets.
A. L. Tryon	Sacramento	Six Hubbard squashes.
A. L. Tryon	Sacramento	Six marrow squashes.
Mrs. M. Sprague	Sacramento	Six crookneck squashes.
G. T. Bascom	Sacramento	One peck tomatoes.
G. T. Bascom	Sacramento	One crookneck squash.
G. T. Bascom	Sacramento	Six marrow squashes.
G. T. Bascom	Sacramento	Six Hubbard squashes.
G. T. Bascom	Sacramento	Six turnip beets.
G. T. Bascom	Sacramento	Twelve sweet corn.
G. T. Bascom	Sacramento	Twenty-five varieties garden seeds.
G. T. Bascom	Sacramento	Six sugar beets.

Class III.—Vegetables, Roots, etc.—Continued.

Exhibitor.	Residence.	Article.
Philip A. Buise	Sacramento	Half bushel red potatoes.
Philip A. Buise	Sacramento	Half bushel white potatoes.
Philip A. Buise	Sacramento	Half bushel sweet potatoes.
Philip A. Buise	Sacramento	Twelve parsnips.
Philip A. Buise	Sacramento	Twelve carrots.
Philip A. Buise	Sacramento	Six long blood beets.
Philip A. Buise	Sacramento	Six turnip beets.
Philip A. Buise	Sacramento	Six sugar beets.
Philip A. Buise	Sacramento	One peck tomatoes.
Philip A. Buise	Sacramento	Six drumhead cabbages.
Philip A. Buise	Sacramento	Six heads of cabbage.
Philip A. Buise	Sacramento	Three heads of cauliflower.
Philip A. Buise	Sacramento	Three heads of broccoli.
Philip A. Buise	Sacramento	Six heads of lettuce.
Philip A. Buise	Sacramento	One peck of red onions.
Philip A. Buise	Sacramento	Half peck of yellow onions.
Philip A. Buise	Sacramento	Half peck of white onions.
Philip A. Buise	Sacramento	Half peck of peppers for pickling.
Philip A. Buise	Sacramento	Twelve roots of salsify.
Philip A. Buise	Sacramento	Six stalks celery.
Philip A. Buise	Sacramento	Six marrow squashes.
Philip A. Buise	Sacramento	Six Hubbard squashes.
Philip A. Buise	Sacramento	Six crookneck squashes.
Philip A. Buise	Sacramento	One pumpkin.
Philip A. Buise	Sacramento	One dozen sweet green corn.
Philip A. Buise	Sacramento	Three mountain sweet watermelons.
Philip A. Buise	Sacramento	Three greenfleshed muskmelons.
Philip A. Buise	Sacramento	Three yellowfleshed muskmelons.
Philip A. Buise	Sacramento	Six cucumbers.
Philip A. Buise	Sacramento	Half peck of Lima beans.
Philip A. Buise	Sacramento	Half peck of dry white beans.
Philip A. Buise	Sacramento	Half peck of kidney bush beans in pod.
Philip A. Buise	Sacramento	Half peck of pole beans.
Philip A. Buise	Sacramento	Half peck of dry field peas.
Philip A. Buise	Sacramento	Half peck of garden peas.
Philip A. Buise	Sacramento	Half peck of castor oil beans.
Philip A. Buise	Sacramento	Three varieties of dry peas.
Philip A. Buise	Sacramento	Half peck gherkins, cucumbers.
Philip A. Buise	Sacramento	Three purple egg plants.
Philip A. Buise	Sacramento	One table of vegetables.
E. B. Hunt	Sacramento	Two pumpkins, for pies.
E. B. Hunt	Sacramento	One squash.
George F. Bascom	Sacramento	Half peck of peas.
D. McGregor	Sacramento	Three watermelons.
Levi Stahl	Sacramento	One early white cucumber.
A. L. Tryon	Sacramento	Six red beets.
Felice Gabrielle	Sacramento	Half bushel red potatoes.
Felice Gabrielle	Sacramento	Half bushel white potatoes.
Felice Gabrielle	Sacramento	Half bushel potatoes.
Felice Gabrielle	Sacramento	Half bushel Irish potatoes.
Felice Gabrielle	Sacramento	Half bushel sweet potatoes.
Felice Gabrielle	Sacramento	Twelve parsnips.
Felice Gabrielle	Sacramento	Twelve carrots.
Felice Gabrielle	Sacramento	Six long blood beets.
Felice Gabrielle	Sacramento	Six turnip beets.
Felice Gabrielle	Sacramento	Six sugar beets.
Felice Gabrielle	Sacramento	One peck tomatoes.
Felice Gabrielle	Sacramento	Six drumhead cabbages.
Felice Gabrielle	Sacramento	Six heads red Dutch cabbage.
Felice Gabrielle	Sacramento	Six other varieties.
Felice Gabrielle	Sacramento	Three heads cauliflower.
Felice Gabrielle	Sacramento	Three heads broccoli.
Felice Gabrielle	Sacramento	Six heads lettuce.
Felice Gabrielle	Sacramento	Half peck red onions.
Felice Gabrielle	Sacramento	Half peck yellow onions.
Felice Gabrielle	Sacramento	Half peck white onions.

Class III.—Vegetables, Roots, etc.—Continued.

Exhibitor.	Residence.	Article.
Felice Gabrielle	Sacramento	Half peck peppers, for pickling.
Felice Gabrielle	Sacramento	Twelve roots of salsify.
Felice Gabrielle	Sacramento	Six stalks of celery.
Felice Gabrielle	Sacramento	Six marrow squashes.
Felice Gabrielle	Sacramento	Six Hubbard squashes.
Felice Gabrielle	Sacramento	Three crookneck squashes.
Felice Gabrielle	Sacramento	One pumpkin.
Felice Gabrielle	Sacramento	One dozen sweet green corn.
Felice Gabrielle	Sacramento	Three mountain sweet watermelons.
Felice Gabrielle	Sacramento	Three watermelons.
Felice Gabrielle	Sacramento	Three green-fleshed muskmelons.
Felice Gabrielle	Sacramento	Three yellow-fleshed muskmelons.
Felice Gabrielle	Sacramento	Six cucumbers.
Felice Gabrielle	Sacramento	One half peck lima beans in pod.
Felice Gabrielle	Sacramento	One half peck dry white beans.
Felice Gabrielle	Sacramenso	One half peck kidney bush beans in pod.
Felice Gabrielle	Sacramento	One half peck pole beans.
Felice Gabrielle	Sacramento	One half peck dry field peas.
Felice Gabrielle	Sacramento	One half peck dry garden peas.
Felice Gabrielle	Sacramento	One half peck castor oil beans.
Felice Gabrielle	Sacramento	Six varieties of dry peas.
Felice Gabrielle	Sacramento	One half peck gherkin cucumbers.
Felice Gabrielle	Sacramento	Three purple egg plants.
Felice Gabrielle	Sacramento	One table of vegetables.
W. C. Hall	Lodi	Eight golden sweet watermelons.
John Bidwell	Chico	Mangel-wurzel.
John Bidwell	Chico	Three watermelons.
John Bidwell	Chico	Three casaba melons.

CLASS IV—FLOWERS.

Thos. O'Brien	Sacramento	One collection of flowering plants in bloom.
Thos. O'Brien	Sacramento	One collection of ornamental foliage plants.
Thos. O'Brien	Sacramento	One collection of new and rare plants.
Thos. O'Brien	Sacramento	One collection of roses in bloom.
Thos. O'Brien	Sacramento	One collection of fuchsias in bloom.
Thos. O'Brien	Sacramento	One collection of cut flowers.
Thos. O'Brien	Sacramento	One collection of bouquets.
Thos. O'Brien	Sacramento	One collection of plants suitable for greenhouse and conservatory.
F. Luderman	San Francisco	One collection of ornamental and foliage plants.
F. Luderman	San Francisco	One collection of new and rare plants.
F. A. Eble	Sacramento	One collection of ornamental and foliage plants.
F. A. Eble	Sacramento	One collection of new and rare plants.
F. F. Eble	Sacramento	One collection of plants suitable for greenhouse and window culture.
F. A. Eble	Sacramento	Display of bouquets.
Frank Kunz	Sacramento	One collection of flowering plants in bloom.
Frank Kunz	Sacramento	One collection of ornamental foliage plants.
Frank Kunz	Sacramento	One collection of roses in bloom.
Frank Kunz	Sacramento	One collection of fuchsias in bloom.
Frank Kunz	Sacramento	Display of cut flowers.
Frank Kunz	Sacramento	Display of bouquets.
Frank Kunz	Sacramento	Display of hanging baskets containing plants.
Terrence Duffy	San Francisco	One hanging basket containing flowers.

CLASS V.—DAIRY PRODUCTS.

CHEESE.

Exhibitor.	Residence.	Article.
W. H. Lowell & Brother	Sacramento	Six cheeses under one year old.
W. H. Lowell & Brother	Sacramento	One cheese under four years old.
J. B. Jewell	Sacramento	One cheese under one year old.
J. B. Jewell	Sacramento	Five cheeses.
Rider & Russell	Galt	One cheese one year old.
Rider & Russell	Galt	Twenty-five cheeses under one year old.
S. D. Morrison	Galt	Eight cheeses under one year old.

BUTTER, BREAD, ETC.

Mrs. E. F. Aiken	Sacramento	Ten pounds of butter in rolls.
Mrs. E. F. Aiken	Sacramento	Three loaves of domestic brown bread.
Mrs. E. S. Hoyt	Sacramento	Display of domestic brown bread.
Mrs. E. S. Hoyt	Sacramento	Display of domestic corn bread.
Mrs. E. S. Hoyt	Sacramento	Display of domestic wheat bread.
Mrs. E. S. Hoyt	Sacramento	Display of domestic rye bread.
Mrs. W. T. Hicks	Sacramento	Display of biscuit.
Mrs. W. T. Hicks	Sacramento	Display of domestic wheat bread.
Mrs. Laura Bable	Sacramento	Thirty pounds of butter in rolls.
Mrs. C. A. Hull	Union House	Display of domestic wheat bread.
Mrs. H. Cronkite	Washington	Display of rye bread, domestic.
Mrs. H. Cronkite	Washington	Display of domestic wheat bread.
Mrs. H. Cronkite	Washington	Display of biscuit.
Mrs. W. Bassett	Sacramento	Display of butter in rolls.
Clara A. Murphy	Brighton	Display of domestic wheat bread.
Mrs. I. S. Holman	Sacramento	Four loaves of wheat bread.
James Askew	El Dorado	Twelve rolls of butter.
James Askew	El Dorado	Twenty-five firkins of butter.
Mrs. F. C. Neal	Sacramento	One loaf of domestic brown bread.
Mrs. W. F. Hicks	Sacramento	One loaf of domestic corn bread.
Mrs. W. F. Hicks	Sacramento	One loaf of domestic brown bread.
Mrs. F. P. Lowell	Sacramento	Display of biscuit.
Mrs. F. P. Lowell	Sacramento	Display of soda biscuit.
Mrs. F. P. Lowell	Sacramento	One loaf of domestic corn bread.
Mrs. F. P. Lowell	Sacramento	One loaf of domestic rye bread.
Mrs. F. P. Lowell	Sacramento	One loaf of domestic brown bread.
Mrs. F. P. Lowell	Sacramento	Two loaves of domestic wheat bread.
Mrs. F. P. Lowell	Sacramento	One loaf of domestic Graham bread.
Clara A. Murphy	Brighton	Display of domestic biscuit.
W. F. Peterson	Sacramento	Four loaves of baker's bread.
Mrs. Wm. Bassett	Sacramento	One loaf of domestic wheat bread.
Mrs. Wm. Bassett	Sacramento	One loaf of domestic brown bread.
Mrs. Wm. Bassett	Sacramento	Display of raised biscuit.

SIXTH DEPARTMENT.

CLASS I.—GREEN FRUITS.

Exhibitor.	Residence.	Article.
P. H. Murphy	Brighton	Three varieties of apples.
P. H. Murphy	Brighton	Twelve varieties of pears.
P. H. Murphy	Brighton	Six varieties of pears.
P. H. Murphy	Brighton	Three varieties of pears.
P. H. Murphy	Brighton	One variety of peaches.
P. H. Murphy	Brighton	One variety of plums.
P. H. Murphy	Brighton	Display of green figs.
P. H. Murphy	Brighton	Display of pears.
A. Mouton	Sacramento	Six varieties of apples.
Gaspard Konigo	Rutherford Station	One bunch of white grapes.
I. S. Bamber	Placerville	Sixteen varieties of pears.
I. S. Bamber	Placerville	Forty varieties of apples.
I. S. Bamber	Placerville	Twenty varieties of peaches.
I. S. Bamber	Placerville	Fourteen varieties of plums.
I. S. Bamber	Placerville	Two varieties of prunes.
I. S. Bamber	Placerville	Six varieties of figs.
I. S. Bamber	Placerville	Two varieties of nectarines.
I. S. Bamber	Placerville	Twenty-eight varieties of seedling fruit.
Williamson & Co.	Sacramento	Display of apples.
Williamson & Co.	Sacramento	Twelve varieties of apples.
Williamson & Co.	Sacramento	Six varieties of apples.
Williamson & Co.	Sacramento	Three varieties of apples.
Williamson & Co.	Sacramento	Display of pears.
Williamson & Co.	Sacramento	Twelve varieties of pears.
Williamson & Co.	Sacramento	Six varieties of pears.
Williamson & Co.	Sacramento	Three varieties of pears.
Williamson & Co.	Sacramento	Display of peaches.
Williamson & Co.	Sacramento	Six varieties of peaches.
Williamson & Co.	Sacramento	One variety of peaches.
Williamson & Co.	Sacramento	Display of plums.
Williamson & Co.	Sacramento	Five varieties of plums.
Williamson & Co.	Sacramento	One variety of plums.
Williamson & Co.	Sacramento	Display of green figs.
Williamson & Co.	Sacramento	Display of tropical fruits, Cal. growth.
Williamson & Co.	Sacramento	Display of oranges.
Williamson & Co.	Sacramento	Display of lemons.
Williamson & Co.	Sacramento	Display of seedling fruits.
Williamson & Co.	Sacramento	Display of fruit by the producer.
Thomas Hardie	Sacramento	Display of peaches.
Thomas Hardie	Sacramento	Six varieties of peaches.
Thomas Hardie	Sacramento	One variety of peaches.
W. H. Jessup	Haywards	Thirteen varieties of pears.
W. H. Jessup	Haywards	Thirty varieties of apples.
W. H. Jessup	Haywards	Twelve varieties of prunes and plums.
A. F. Hatch	Cordelia	Six varieties of pears.
A. F. Hatch	Cordelia	Three varieties of pears.
John Bidwell	Chico	Twenty-two varieties of apples.
John Bidwell	Chico	Sixteen varieties of pears.
John Bidwell	Chico	One variety of pomegranates.
John Bidwell	Chico	Three varieties of figs.

CLASS II.—HONEY, PRESERVES, PICKLES, ETC.

Exhibitor.	Residence.	Article.
Mrs. E. S. Hunt	Sacramento	Six glasses of strawberry jelly.
Mrs. E. S. Hunt	Sacramento	Six glasses of blackberry jelly.
Mrs. E. S. Hunt	Sacramento	Six glasses of quince jelly.
Mrs. E. S. Hunt	Sacramento	Six jars of blackberry jam.
Mrs. E. S. Hunt	Sacramento	Six jars of strawberry jam.
Mrs. E. S. Hunt	Sacramento	One jar of preserved peaches.
Mrs. E. S. Hunt	Sacramento	Two jars of preserved plums.
Mrs. E. S. Hunt	Sacramento	One jar of brandy peaches.
Mrs. H. Cronkite	Walsh's Station	Forty-seven varieties of canned fruit.
Mrs. H. Cronkite	Walsh's Station	Eight varieties of preserves.
Mrs. H. Cronkite	Walsh's Station	Six jars of red currant jelly.
Mrs. H. Cronkite	Walsh's Station	Six jars of black currant jelly.
Mrs. H. Cronkite	Walsh's Station	Six jars of red raspberry jelly.
Mrs. H. Cronkite	Walsh's Station	Twelve jars of blackberry jelly.
Mrs. H. Cronkite	Walsh's Station	Six jars of quince jelly.
Mrs. H. Cronkite	Walsh's Station	Six jars of strawberry jelly.
Mrs. H. Cronkite	Walsh's Station	Nine jars of apple jelly.
Mrs. H. Cronkite	Walsh's Station	Three jars of black raspberry jam.
Mrs. H. Cronkite	Walsh's Station	Three jars of red raspberry jam.
Mrs. H. Cronkite	Walsh's Station	Six jars of blackberry jam.
Mrs. H. Cronkite	Walsh's Station	Four jars of plum butter.
Mrs. H. Cronkite	Walsh's Station	Two jars of cucumber pickles.
Mrs. H. Cronkite	Walsh's Station	Seven jars of cucumber salad.
Mrs. H. Cronkite	Walsh's Station	Seven jars of chowchow.
Mrs. H. Cronkite	Walsh's Station	Two bottles of pickled corn.
Mrs. H. Cronkite	Walsh's Station	One jar of beans and onions.
Mrs. H. Cronkite	Walsh's Station	One jar of olives.
Mrs. H. Cronkite	Walsh's Station	Two jars of asparagus.
Mrs. H. Cronkite	Walsh's Station	Five jars of tomato catchup.
Mrs. H. Cronkite	Walsh's Station	One jar of plum catchup.
Mrs. H. Cronkite	Walsh's Station	One jar of mushroom catchup.
Mrs. H. Cronkite	Walsh's Station	One jar of sweet cucumber pickles.
Mrs. Wm. Bassett	Sacramento	Six glasses of currant jelly.
Mrs. Wm. Bassett	Sacramento	Six jars of blackberry jelly.
Mrs. Wm. Bassett	Sacramento	Six jars of raspberry jelly.
Mrs. Wm. Bassett	Sacramento	Three jars of grape jelly.
Mrs. Wm. Bassett	Sacramento	Six jars of blackberry jam.
Mrs. Wm. Bassett	Sacramento	Six jars of raspberry jam.
Mrs. L. E. McMahon	Sacramento	Three jars of sweet cucumber pickles.
Mrs. L. E. McMahon	Sacramento	Three jars of sweet peach pickles.
Mrs. L. E. McMahon	Sacramento	Three jars of sweet quince pickles.
Mrs. L. E. McMahon	Sacramento	One jar of mangoes.
Mrs. L. E. McMahon	Sacramento	Five jars of chowchow.
Mrs. L. E. McMahon	Sacramento	Two jars of sliced pickles.
Mrs. L. E. McMahon	Sacramento	Three jars of quince preserves.
Mrs. L. E. McMahon	Sacramento	Three jars of pear preserves.
Mrs. L. E. McMahon	Sacramento	One dozen bottles of olive oil.
Mrs. L. E. McMahon	Sacramento	One sample of olives.
Mrs. A. L. Hoyle	Sacramento	Twelve glasses of jelly, Siberian crabapple and plum.
Mrs. G. T. Bascom	Sacramento	One jar of brandy peaches.
Mrs. J. R. Lawrie	Santa Clara	Twelve jars of assorted fruit.
Miss M. T. Hunt	Washington	Six jars of quince jelly.
Miss M. T. Hunt	Washington	Six jars of strawberry jelly.
Miss M. T. Hunt	Washington	Six jars of raspberry jelly.
Miss M. T. Hunt	Washington	Six jars of blackberry jelly.
Miss M. T. Hunt	Washington	Six jars of red currant jelly.
Miss M. T. Hunt	Washington	Six jars of blackberry jam.
Miss M. T. Hunt	Washington	Six jars of raspberry jam.
Miss Belle Henley	Sacramento	Six jars of blackberry jelly.
Miss Belle Henley	Sacramento	Six jars of quince jelly.
Mrs. T. A. Ebel	Sacramento	Six glasses of currant jelly.
Mrs. T. A. Ebel	Sacramento	Six glasses of blackberry jelly.
Mrs. H. G. Tonseca	Centerville	Four glasses of preserved pears.

CLASS III.—PRESERVED FRUITS, NUTS, ETC.

Exhibitor.	Residence.	Article.
Mrs. E. F. Aiken	Sacramento	Twenty-five pounds of dried plums.
Mrs. E. S. Hart	Florin	Twenty-five pounds of dried pears.
Mrs. E. S. Hart	Florin	Twenty-five pounds of dried plums.
Mrs. E. S. Hart	Florin	Twenty-five pounds of dried apples.
Mrs. E. S. Hart	Florin	Twenty-five pounds of dried figs
Mrs. H. Cronkite	Walsh's Station	Twelve varieties of dried berries.
Allyne & White	San Francisco	Wash for destroying scale insects on fruit trees.
Allyne & White	San Francisco	Wash for destroying codling moth and larvæ on fruit trees.
Mrs. J. R. Lawrie	Placerville	Twenty-five pounds dried apples.
Mrs. J. R. Lawrie	Placerville	Twenty-five pounds dried apricots.
Mrs. J. R. Lawrie	Placerville	Twenty-five pounds dried plums.
W. H. Jessup	Haywards	Eight boxes dried plums.
A. D. Miller	Walsh's Station	One peck soft shell almonds.
J. K. Gries	Santa Paula	One lot walnuts.
I. S. Bamber	Placerville	Ten pounds dried figs.
A. F. Hatch	Cordelia	Thirty-three varieties seedling almonds.
John Bidwell	Chico	One box sun-dried purple plums.
John Bidwell	Chico	One box sun-dried green gages.
John Bidwell	Chico	One box sun-dried blue damsons.
John Bidwell	Chico	One box sun-dried prunes.
John Bidwell	Chico	One box sun-dried apples.
John Bidwell	Chico	One box patent-dried prunes.

LIQUORS.

Johnson Manufacturing Co.	Sacramento	Twelve bottles brandy, vintage of 1876.
Johnson Manufacturing Co.	Sacramento	Twelve bottles brandy, vintage of 1878.
Johnson Manufacturing Co.	Sacramento	Twelve bottles brandy, vintage of 1879.
Johnson Manufacturing Co.	Sacramento	Twelve bottles port wine, vintage of 1878.
Johnson Manufacturing Co.	Sacramento	Twelve bottles angelica, vintage of 1878.
Johnson Manufacturing Co.	Sacramento	Twelve bottles sherry, vintage of 1878.
Johnson Manufacturing Co.	Sacramento	Twelve bottles muscatelle, vintage of 1878.
Brighton Distillery Co.	Brighton	Twelve bottles grape brandy.
Brighton Distillery Co.	Brighton	Twelve bottles port wine.
G. W. Chesley	Sacramento	One hundred and twenty bottles rock and rye.
G. W. Chesley	Sacramento	Five gallons of peach and honey.
Mrs. H. Cronkite	Walsh's Station	Twelve bottles of port wine.
Mrs. H. Cronkite	Walsh's Station	Twelve bottles of white wine.
Mrs. H. Cronkite	Walsh's Station	Twelve bottles of red wine.

GRAPES.

P. H. Murphy	Brighton	Twelve varieties of table grapes.
P. H. Murphy	Brighton	Six varieties of table grapes.
P. H. Murphy	Brighton	Three varieties of table grapes.
P. H. Murphy	Brighton	Twelve varieties of wine grapes.
P. H. Murphy	Brighton	Six varieties of wine grapes.
P. H. Murphy	Brighton	Three varieties of wine grapes.
P. M. Murphy	Brighton	Display of grapes.
P. H. Murphy	Brighton	Display of raisin grapes.
R. S. Lockett	Brighton	Six varieties of table grapes.
R. S. Lockett	Brighton	Three varieties of wine grapes.
R. S. Lockett	Brighton	Three varieties of raisin grapes.
California Raisin Company		Display of grapes, muscats of Alexandria.
I. S. Bamber	Placerville	Eleven varieties of grapes.
Thos. Hardie	Placerville	Display of grapes.
Thos. Hardie	Placerville	Twelve varieties table grapes.
Thos. Hardie	Placerville	Six varieties table grapes.
Thos. Hardie	Placerville	Three varieties table grapes.

Class II.—Grapes—Continued.

Exhibitor.	Residence.	Article.
Thos. Hardie	Placerville	Display of raisins.
James Rutler	Florin	Display of raisins.
James Rutler	Florin	Twelve varieties of table grapes.
James Rutler	Florin	Six varieties of table grapes.
James Rutler	Florin	Three varieties of table grapes.
James Rutler	Florin	Twelve varieties of wine grapes.
James Rutler	Florin	Six varieties of wine grapes.
James Rutler	Florin	Three varieties of wine grapes.
James Rutler	Florin	One variety of raisins.
James Rutler	Florin	Display of grapes.
John Bidwell	Chico	Five varieties of grapes.

MISCELLANEOUS DEPARTMENT.

Davis Sewing Machine Co.	San Francisco	Display of sewing machine—the Davis.
Charles Deaves	San Francisco	Mechanical marionettes.
C. W. Clark	Sacramento	Reversible and self-cleansing water filter.
Dr. Henly	San Francisco	Fourteen cases of Oregon kidney tea.
W. H. Olman	San Francisco	One Olman steam engine.
I. L. Merrill	San Francisco	Reed pipe and boiler covering.
I. L. Merrill	San Francisco	Crude and pulverized asbestos.
I. L. Merrill	San Francisco	Asbestos packing.
I. L. Merrill	San Francisco	Pulverized soapstone.
I. L. Merrill	San Francisco	Pulverized tule and ochre.
I. L. Merrill	San Francisco	Four samples soapstone mastic roofing.
I. L. Merrill	San Francisco	One sample silicate.
Capital Woolen Mills	Sacramento	One fancy cashmere loom.
L. L. Lewis	Sacramento	One scroll sawing machine.
C. H. Larrabee	Sacramento	Two ant-proof safes.
Osborne & Alexander	San Francisco	One scroll saw.
Osborne & Alexander	San Francisco	One velocipede saw.
Osborne & Alexander	San Francisco	One fire escape.
M. De Costa	Sacramento	Display of carman seed.
B. N. Bugbey	Folsom	Four Wible's patent vehicles, axles, and model.
B. N. Bugbey	Folsom	Seven Wible's patent rubber axle cushions.
B. N. Bugbey	Folsom	One model of Wible's patent drawbridge.
I. L. Merrill	San Francisco	Asbestos, for gas pipe and steam packing.
D. A. Dyer	Ferndale	Model of patent breakwater and submarine wall.
A. P. Peck	San Francisco	Wilcox & Gibbs' sewing machines.
B. McCreary	Sacramento	Eighteen cans Thorley's food.
John Simon	Oakland	Burglar-proof door knob alarm.
Cook & Son	Sacramento	Bone fertilizer.
G. W. Melco	Stockton	Buhach insect powder.
G. W. Melco	Stockton	Buhach insufflator.
George L. Wenzel	San Francisco	One apple and grape crusher and separator.
George L. Wenzel	San Francisco	One cider press.
Dale & Co.	Sacramento	One carriage or cab for children.
J. H. Burke	San Luis Obispo	One fruit drier.
Mrs. L. E. McMahon	Dixon	Three gallons of cider vinegar.
E. W. Melvin	Davisville	One Avalanche rotary flour and meal sifter.
C. W. Garland	Oakland	One Garland improved sewer gas trap.
C. W. Garland	Oakland	One patent harvester sharpener.
John Reardon	Ione City	One patent window screen.
Mrs. N. Neely	Sacramento	Two Leghorn chicken eggs.
G. G. Wickson	San Francisco	One Eclipse self-regulating incubator.
G. G. Wickson	San Francisco	One Eclipse artificial mother.
G. G. Wickson	San Francisco	One La Motte artificial mother.
Henry Hillwager	San Francisco	One Kuncle roller washing machine.
Henry Hillwager	San Francisco	One Thompson's apple parer and corer.
Henry Hillwager	San Francisco	Display of German salve.

Miscellaneous Department—Continued.

Exhibitor.	Residence.	Article.
Mrs. E. A. Hill	Comanche	Display of Mrs. Hill's insect powder.
James H. Gates	San Francisco	Display of Dr. Thomas Hall's pepsin wine bitters.
Osborne & Alexander	San Francisco	One bicycle.
H. Nagle	Boulden Island	One cranberry plant.
F. C. M. Fenn	San Francisco	Display of improved meat and vegetable slicers.
Hobby & Smith	Sacramento	One Guinean's patent Universal refrigerator.
Hobby & Smith	Sacramento	One Guinean's patent spring filter.
M. C. Hammer	Sacramento	Twenty dozen bottles Hammer's Cascara Sagrada Bitters.
California Volcanic Mineral Water Co.	San Francisco	Thirty-eight dozen bottles natural spring mineral water.
J. E. Hetherington	San Francisco	One case Tropic Fruit Laxative.
Ed. J. Puler	San Francisco	Four thousand foreign and miscellaneous gold and silver coins.
James G. Glover	Sacramento	Display of stamping and stamping patterns.
Tom Cassilli	San Francisco	One minature model of Cleopatra's Needle.
Wheeler & Wilson Manufacturing Co.	San Francisco	Display of Wheeler & Wilson sewing machines.
J. A. Studabecker	San José	One tailor square for dress and cloak fitting.
William Eberhardt	Sacramento	Display of meerschaum.
William Eberhardt	Sacramento	Display of amber work.
William Pfunder	Portland, Oregon	Five gross Oregon Blood Purifier.
William Pfunder	Portland, Oregon	One gross Safe, Sure and Speedy Fever and Ague Cure.
John F. Cooper	Sacramento	Display of baby carriages.
John F. Cooper	Sacramento	Perfumery and toilet soaps.
John Heppart	Nevada City	One Bible printed in Ingolstadt, July, 1602.
Little & Moen	Petaluma	One pair patent dividing compasses.

SEVENTH DEPARTMENT.

FINE ARTS.

Subject.	Artist.
Chamois Hunter	Chas. Prosch.
Mediæval Figure	Mrs. Joe Strong.
Mediæval Figure	Mrs. Joe Strong.
Fruit	Mrs. T. H. Lewis.
Flowers	Mrs. T. H. Lewis.
Perils of Prospecting	W. R. Freeman.
Washington	Chas. Prosch.
Still Life	Henry Clenewerck.
View in Gulf of Spezio	Henry Clenewerck.
Landscape	Henry Clenewerck.
Marine	Henry Clenewerck.
Still Life	Henry Clenewerck.
Autumn Scene, White Mountains	Fred. Schafer.
Elsinore by Moonlight	W. A. Coulter.
Arrival of General Grant	W. A. Coulter.
Tartouf	F. Bouvy.
Portrait	F. Bouvy.

Fine Arts—Continued.

Subject.	Artist.
Portrait	F. Bouvy.
Portrait	F. Bouvy.
Solid Comfort	F. Bouvy.
Maraquita Going to Her First Bull Fight	F. Bouvy.
Gil Blas	F. Bouvy.
Portrait	F. Bouvy.
Portrait	F. Bouvy.
The Revenge	A. De Succa.
Portrait	S. W. Shaw.
Portrait	Chas. Prosch.
Logging Camp	Wm. Hahn.
On the Rhine	Wm. Hahn.
Newport	Wm. Hahn.
Playing School	Wm. Hahn.
Red Ridinghood	Wm. Hahn.
Winter in Nebraska	Wm. Hahn.
Newsboys in New York	Wm. Hahn.
Austin Creek	Julian Rix.
"Idlewild"—Lake Tahoe	Norton Bush.
River San Juan—Nicaragua	Norton Bush.
Afternoon on the Truckee	Norton Bush.
Coast Scene—near Santa Cruz	Norton Bush.
Uncle Sam Mountain—Clear Lake	Norton Bush.
Lake Tahoe	Norton Bush.
Tropical Sketch	Norton Bush.
Morning on the River	Norton Bush.
Tropical Sketch	Norton Bush.
Sunset on Clear Lake	Norton Bush.
"Chimney Rock"—after Bierstadt	Norton Bush.
Off the Coast of Peru	Norton Bush.
Beach near San Francisco	Norton Bush.
Cornelian Bay—Lake Tahoe	Norton Bush.
Suburbs of Sacramento	Norton Bush.
Coast Scene near Pescadero	Norton Bush.
Big Tree Grove—Santa Cruz	Norton Bush.
Down the Coast	Norton Bush.
Mt. Diablo—Spring time	Norton Bush.
Rio Obispo—Isthmus of Panama	Norton Bush.
A Tropical Afternoon	Norton Bush.
Scene in Nicaragua	Norton Bush.
Lake Maggiore—Italy	Paul Weber.
Silver	S. M. Brookes.
Apples	S. M. Brookes.
Apples	S. M. Brookes.
Crystal	S. M. Brookes.
Hard Road to Travel	Wm. Halm.
Still Life	S. M. Brookes.
Portraits	Joe Strong.
Portrait	Joe Strong.
Training the Puppy Regardless of Cost	E. Narjot.
Ophelia	E. Narjot.
Portrait	E. Narjot.
Light and Shade	E. Narjot.
On the Beach	E. Narjot.
Quail Shooting	E. Narjot.
Flirting on the Road	E. Narjot.
Arab Girl	E. Narjot.
Explaining the Problem	Henry Raschen.
Norway Fiord	Sam'l G. Phillips.
Still Life	Miss M. Jones.
Life's Young Dream—after P. A. Cot	W. T. Jackson.
Mary Stuart's Last Confession	Henry Raschen.
Bear River—Nevada	W. T. Jackson.
Mountain Stream—Sierra Nevada	W. T. Jackson.
Mazatlan	F. Schafer.
Landscape	F. Schafer.

Fine Arts—Continued.

Subject.	Artist.
Portrait	Emil Lund.
Portrait	Emil Lund.
Portrait of Governor Geo. C. Perkins	Emil Lund.
Childhood—after C. L. Vogel	
Youthful Gambols	Hottenroth.
German Interior	F. Wendler.
Flowers	Miss Williams.
The Sleeping Beauty	Walther.
Scene in the Alps	C. Millner.
Grandma's Gift	Most.
Whoa, Emma	Chas. C. Nahl.
Tonsorial Studio	Aug. Hego.
Morning Prayers	J. M. Hoffman.
Portrait	F. Pebbles.
Portrait—on marble	
Portrait—on marble	
Photograph in oil	Miss Julia Ostrom.
Love's Young Dream	Miss Julia Ostrom.
Our Puss—crayon drawing	Miss Julia Ostrom.
Crayon Photo	Miss Julia Ostrom.
My Partner in the Dance—pastel painting	Miss Julia Ostrom.
Flowers in oil	Miss Julia Ostrom.
On Guard—pastel	Miss Julia Ostrom.
The Wounded Dove—in oil	Miss Julia Ostrom.
Portrait in oil	Miss Julia Ostrom.
Crayon Portrait	Miss Julia Ostrom.
Crayon Portrait	Miss Julia Ostrom.
Photo in oil	Miss Julia Ostrom.
Photo in oil	Miss Julia Ostrom.
Portrait—medallion	Miss Julia Ostrom.
Portrait—water colors	Miss Julia Ostrom.
Charcoal Drawing from Life	Miss Amanda Austin.
Charcoal Drawing	Miss Amanda Austin.
Charcoal Drawing from Life	Miss Amanda Austin.
Charcoal Drawing	Miss Amanda Austin.
Tropical Scene	Miss Amanda Austin.
Flowers	Miss Amanda Austin.
Flowers	Miss Amanda Austin.
Tropical Scene	Miss Flora Weeks.
Tropical Scene	Miss Flora Weeks.
Flowers—in oil	Miss Flora Weeks.
Flowers—in oil	Miss Flora Weeks.
Scene on the South Pacific Coast Railroad, six miles from Santa Cruz	Alma Woodleigh.
Scene on the South Pacific Coast Railroad, three and a half miles from Santa Cruz	Alma Woodleigh.
Orphan Rock—Tasmanian scene	Alma Woodleigh.
Big Creek Waterfall—Santa Cruz	Alma Woodleigh.
Upper Merced—Yosemite Valley scene	Alma Woodleigh.
Santa Cruz Beach scene	Alma Woodleigh.
Snowy River—Australia	Alma Woodleigh.
Snowy River at a Distance—Australian scene	Alma Woodleigh.
Cathedral Rock—Yosemite Valley	Alma Woodleigh.
Santa Cruz Mountains	Alma Woodleigh.
Natural Bridge—near Santa Cruz	Alma Woodleigh.
Mount Washington	Blehman.
Sleepy Hollow—on the Hudson	Blehman.
Humboldt Palisades	Alma Woodleigh.
View on the Sacramento	Miss Flora Carroll.
Rio Grande—Panama	Miss Flora Carroll.
View near Sacramento	Miss Flora Carroll.
Tropical Morning	Miss Flora Carroll.
Tropical Moonlight	Miss Flora Carroll.
Autumn Scene	Miss Flora Carroll.
Painting on plaque	Miss Flora Carroll.
Landscape	Miss Flora Carroll.

Fine Arts—Continued.

Subject.	Artist.
Wood Scene	Miss Flora Carroll.
Landscape	Miss Flora Carroll.
Chinese Consul General	F. M. Pebbles.
Portrait—crayon	Ida Elkus.
Portrait—crayon	Eugene Elkus.
Lover's Leap—Strawberry, El Dorado County	W. J. Straight.
Portrait—crayon	W. F. Jackson.
Works by Pupils in the School of Design.	
Spring	Frederick Flohr.
Sleeping Child	Frederick Flohr.
Marble Frame	Frederick Flohr.
Drawings	Aaron H. Powers, Jr.
Old Dutch Farmer	H. A. Dickson.
Sheep	H. A. Dickson.
Cattle	H. A. Dickson.
Monogram of the English Alphabet	J. B. Nelson.
Landsburg Castle	H. A. Dickson.
Portrait	J. Ostrom.
Crayons	Miss L. J. Turrell.
Flowers	Miss L. J. Turrell.
Flowers	Miss L. J. Turrell.
Porcelain Painting	Mrs. E. C. Bingay.

SPEED PROGRAMME—1880.

MONDAY, SEPTEMBER 20TH.

RACE NO. 1—RUNNING.

Stake of three-fourths mile dash for two-year olds. One hundred and fifty dollars added. First horse receives two hundred and sixty-five dollars; second saves entrance.

NAME AND PEDIGREE OF HORSE.	By Whom Entered.	P. O. Address.
Zeta Psi, by Monday; dam, J. W. Dougherty's Arabian horse	W. Lynch	San Ramon.
Lilly Ashe, by Joe Daniels; dam, Reveille, by Woodburn	D. S. Terry	Stockton.
———, by Shannon; dam by Lodi	W. H. Coombs	Napa.
———, by Shannon; dam by Lodi	W. H. Coombs	Napa.

Position at Starting.		*Position at Close of Race.*	
1. W. H. Coombs' chestnut colt	1	W. H. Coombs' chestnut colt	1
2. Lilly Ashe	2	Lilly Ashe	2
3. W. H. Coombs' brown colt	3	W. H. Coombs' brown colt	3

Time—Three-fourths of a mile, 1:19½.

RACE NO. 2—RUNNING.

Free for all; stake one hundred and fifty dollars; twenty-five dollars each, pay or play; one hundred pounds on each. Mile dash; first premium, two hundred and fifty dollars; second, fifty dollars; third, save stake.

NAME AND PEDIGREE OF HORSE.	By Whom Entered.	P. O. Address.
Snowden, by Bloomsburg; dam by Norfolk	George Howson	Sacramento.
Illusion, by Alarm; dam, Mary Hadley	W. L. Appleby	Carson, Nevada.
Lena Dunbar, by Leinster; dam, Tibbie Dunbar	W. L. Pritchard	Sacramento.
Twilight, by Norfolk; dam, Kate Gift	Theo. Winters	Winters, Yolo.
Clara D., five years, by imp. Glenelg; dam, The Nun	E. J. Baldwin	San Gabriel.
Lexingtor, four years, by Lexington; dam, Volga	E. J. Baldwin	San Gabriel.
Jennie B., four years, by imported Glenelg; dam, Regan	E. J. Baldwin	San Gabriel.

Position at Starting.		*Position at Close of Race.*	
1. Jennie B.	1	Jennie B.	1
2. Lena Dunbar	2	Snowden	2
3. Snowden	3	Lena Dunbar	3
4. Lexingtor	4	Illusion	4
5. Illusion	5	Lexingtor	5

Time—Full mile, 1:42¾.

RACE NO. 3—RUNNING.

Three years old, one and one eighth miles dash; stake, two hundred and fifty dollars. Fifty dollars entrance; fifteen dollars forfeit. Flood ten pounds, Connor seven, Euchre five, over rule weight. First premium, three hundred and fifty-five dollars; second, seventy-five dollars; third, save stakes.

NAME AND PEDIGREE OF HORSE.	By Whom Entered.	P. O. Address.
Wild Idler, by Wildidle; dam, Eva Coombs	P. Goodwin	Los Angeles.
Jack Douglas, by Wildidle; dam, Lady Clare	J. A. Cardinell	San Francisco.
Euchre, by Leinster; dam, Flush	W. L. Pritchard	Sacramento.
Tillie C., by Wildidle; dam, Don Victor	W. H. Coombs	Napa.
Connor, by Norfolk; dam, Addie C	Theo. Winters	Winters, Yolo.
Haddington, by imp. Haddington; dam, Prairie Flower	J. McM. Shafter	San Francisco.
Tyler, by Wildidle; dam, Lizzie Brown	J. & H. C. Judson	Santa Clara.

Position at Starting.		*Position at Close of Race.*	
1. Euchre	1	Euchre	1
2. Haddington	2	Tyler	2
3. Wild Idler	3	Haddington	3
4. Tyler	4	Wild Idler	4

Time—1:58¾.

RACE NO. 4—RUNNING.

Free for all; one and one half miles dash; stake, three hundred dollars; twenty-five dollars entrance; ten dollars forfeit; first premium, three hundred and fifteen dollars; second premium, seventy-five dollars; third, save stake.

NAME AND PEDIGREE OF HORSE.	By Whom Entered.	P. O. Address.
Snowden, by Bloomsbury; dam, by Norfolk	Geo. Howson	Sacramento.
Connor, by Norfolk; dam, Addie C	Theo. Winters	Winters, Yolo.
Twilight, by Norfolk; dam, Kate Gift	Theo. Winters	Winters, Yolo.
Neapolitan, by Wardance; dam, Eliza Davis	Theo. Winters	Winters, Yolo.
Bessie Sedgwick, four years, by Joe Daniels; dam, by Starlight	D. S. Terry	Stockton.
Lucy R., by Longfellow; dam, Sallie Travis	F. S. Malone	San Francisco.
Clara D., four years old, by imp. Glenelg; dam, The Nun	E. J. Baldwin	San Gabriel.
Jennie B., four years old, by imp. Glenelg; dam, Regan	E. J. Baldwin	San Gabriel.

Position at Starting.		*Position at Close of Race.*	
1. Connor	2	Clara D	1
2. Liilie R.	dr	Connor	2
3. Clara D	1		

Time—2:39.

RACE NO. 5—RUNNING.

For three-year old fillies. Stake, two hundred dollars. Twenty-five dollars entrance; ten dollars forfeit; two hundred dollars added. Three-quarter mile heats. First premium, two hundred and fifty dollars; second, fifty dollars; third save stake.

Race No. 5—Continued.

Name and Pedigree of Horse.	By whom Entered.	P. O. Address.
Tillie C., by Wildidle; dam, by Don Victor	W. H. Coombs	Napa.
Nighthawk, by Imp. Haddington: dam, Napa Queen	J. McM. Shafter	San Francisco.
Sallie Black, by Waterford; dam, Lilly Simpson	P. M. Chatterton	Sacramento.
Carmelita, by Lodi; dam, by Cheatam	G. Pacheco	Novato.
Ella Doane, by Wildidle; dam, Nettie Brown	J. & H. C. Judson	Santa Clara.

Position at Start.					*Position at Close of Race.*				
1. Nighthawk	2	2	1	1	Nighthawk	2	2	1	1
2. Ella Doane	1	4	3	3	Ella Doane	1	4	3	3
3. Carmelita	4	5	5 r.o.		Sallie Black	5	1	4	2
4. Sallie Black	5	1	4	2	Tillie C.	3	3	2 r.o.	
5. Tillie C	3	3	2 r.o.		Carmelita	4	5	5 r.o.	

Time—1:16; 1:17; 1:19½; 1:22.

TUESDAY, SEPTEMBER 31st.

Race No. 6—Pacing.

Free for all. Purse, six hundred dollars. Five to enter, three to start. Mile heats, best three in five. First, premium two thirds; second two thirds of remainder; third, balance.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Nimrod, unknown	W. H. Cade	Oakland.
Johnny Weigle, unknown	George A. Vignolo	Los Angeles.
Washington, by Bucephalus; dam, a Leviathan mare	S. Sperry	Petaluma.
Hi Tracy, unknown	E. H. Robinson	Hill's Ferry.
Mollie K., unknown	J. M. Ross	Winnemucca.
Dido, by Scott's Hialogo; dam, Columbia	C. W. Smith	San Francisco.

Position at Start.					*Position at Close of Race.*				
1. Hi Tracy	4	4	4	3	Nimrod	3	1	1	1
2. Johnny Weigle	1	3	2	2	Johnny Weigle	1	3	2	2
3. Nimrod	3	1	1	1	Washington	2	3	3	4
4. Dido	distanced.				Hi Tracy	4	4	4	3
5. Washington	2	2	3	4	Dido	distanced.			

Time—2:24; 2:21¾; 2:22½; 2:22½.

Race No. 7—Trotting.

Stake for two-year olds.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Fred. Low, by Electioneer; dam, Meleuche, by St. Clair	L. Stanford	Palo Alto.
Maybell, by Electioneer; dam, May Flower, by St. Clair	L. Stanford	Palo Alto.
Flight, by Buccaneer; dam, by Flaxtail	M. W. Hicks	Chico.
Sweetheart, by Sultan; dam, Minnehaha	L. J. Rose	San Gabriel.
Baton Rouge, by Echo; dam, by Howard's Mambrino	J. C. Newton	San Gabriel.

Position at Start.			*Position at Close of Race.*		
1. Sweetheart	1	1	Sweetheart	1	1
2. Fred. Crocker	2	2	Fred. Crocker	2	2

Time—2:31½; 2:32¼.

Race No. 8—Trotting.

For two minutes and forty seconds class. Mile heats, best three in five. Purse, one thousand dollars. (Deitz mare barred.)

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Tommy Dodd, by Alexander; dam, a Clay mare	R. Milroy	San Francisco.
Clay, by Fred. Low; dam, Maid of Clay, by Henry Clay	L. Stanford	Palo Alto.
San Mateo Belle, by Speculation; dam, Young Lady Vernon	W. Z. Price	San Mateo.
Susie, by Geo. M. Patchen, Jr.; dam, Santa Clara	Robt. Beck	Oakland.
Buccaneer, by Iowa Chief; dam, by Flaxtail	W. W. Hicks	Chico.
John Franor, by Grickson; dam, a Star mare	Trahern and Dudley	Stockton.
Ewing	R. J. Merkley	Sacramento.
Lady Ellen, by Carr's Mambrino; dam, by Owen Dale	D. J. Green	San Francisco.
Venus, by Venture; dam, unknown	B. Timmons	Hicksville.

Position at Start.

1. Venus	2	2	3	2	2
2. Susie	dis				
3. Lady Ellen	5	4	1	1	1
4. Tommy Dodd	1	3 dis			
5. Clay	3	1	2 dis		
6. San Mateo Belle	4	5	4	3 dis	
7. Ewing	dis				

Position at Close of Race.

Lady Ellen	5	4	1	1	1
Venus	2	2	3	2	2
San Mateo Belle	4	5	4	3 dis	
Clay	3	1	2 dis		
Tommy Dodd	1	3 dis			
Susie	dis				
Ewing	dis				

Time—2:24; 2:28; 2:29½; 2:31; 2:33.

Race No. 9—Trotting.

Stake, four thousand dollars—for foals of eighteen hundred and seventy-seven.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Hattie Johnson, by Echo; dam, unknown	L. H. Titus	San Gabriel.
Phaciola, by Silverthread; dam, Minnehaha	L. J. Rose	San Gabriel.
Prima Donna, by Mohawk Chief; dam, Matis Occidentis	L. Stanford	Palo Alto.
———, by Mohawk Chief; dam, May Fly	L. Stanford	Palo Alto.
Bell Echo, by Echo; dam, by Belmont	J. C. Newton	San Gabriel.

Position at Start.

1. Belle Echo	1	1	1
2. Phaciola	2	3	3
3. Hattie Johnson	3	2	2

Position at Close of Race.

Belle Echo	1	1	1
Hattie Johnson	3	2	2
Phaciola	2	3	3

Time—2:48½; 2:48½; 2:49¾.

WEDNESDAY, SEPTEMBER 22D.

RACE NO. 10—TROTTING.

Purse, one thousand two hundred dollars—for two twenty-five class.

NAME AND PEDIGREE OF HORSE.	By Whom Entered.	P. O. Address.
Derigo, by Fox Hunter; dam, unknown	W. W. Moore	Oakland.
Gibraltar, by Echo; dam, unknown	M. Salisbury	San Francisco.
Elaine, by Messenger Duroc; dam, Green Mountain Maid, by Henry Clay	L. Stanford	Palo Alto.
Pat. Hunt, by Tecumseh; dam, by St. Clair	D. R. Hunt	Napa.
Barney, by Mike; dam, said to be an imported mare, by Belmont	D. S. Fraiser	San Francisco.
Startle, by Andrews' horse; dam, Maggie, by the Aroostook horse	E. W. Morston	Pescadero.
Reliance, by Alexander; dam, Maud, by Membrino's Rattler	J. M. Learned	Stockton.
Echora, by Echo; dam, the Young mare	L. H. Titus	San Gabriel.

Position at Start.				*Position at Close of Race.*			
1. Gibraltar	2	2	3	Elaine	1	1	1
2. Elaine	1	1	1	Gibraltar	2	2	3
3. Reliance	3	4	4	Echora	4	3	2
4. Echora	4	3	2	Reliance	3	4	4

Time—2:21¼; 2:22½; 2:24.

RACE NO. 11.—TROTTING.

Stake for three years old or under.

NAME AND PEDIGREE OF HORSE.	By Whom Entered.	P. O. Address.
Glencora, by Mohawk Chief; dam, Lady Gilbert	H. R. Covey	Palo Alto.
Emperor, by Ralston; dam, Kitty Tricks	A. C. Dietz	Oakland.
State of Maine, by Seal's Elmo; dam, Kitty Clyde	E. L. Mayberry	San Gabriel.
Revolution, by Prince of Orange; dam, Cricket	Geo. W. Trahern	Stockton.
Leu Rose, by A. W. Richmond; dam, Barbara	C. A. Durfee	Los Angeles.
Phaciola, by Silverthread; dam, Minnehaha	E. Newland	Oakland.
Alex. Button, by Alexander; dam, Lady Button	Frank Button	Santa Rosa.
Upright, by Whipple's Hambletonian; dam, Gilroy Belle, by Lodi	W. E. Morris	Stockton.
Honesty, by Priam; dam, by Chieftain	Jno. Dodge	Stockton.
Annie Lawrie, by Echo; dam, by Tenbroeck, bright bay	W. Smith	Savannah.
Belle Echo, by Echo; dam, by Belmont	J. C. Newton	San Gabriel.

Position at Start.						*Position at Close of Race.*					
1. Annie Lawrie	2	1	4	0	5	Alex. Button	1	2	1	0	1
2. Honesty	3	4	5	4	4	Annie Lawrie	2	1	4	0	5
3. Alex. Button	1	2	1	0	1	Belle Echo	4	3	2	3	2
4. Leu Rose	5	5	3	5	3	Honesty	3	4	5	4	4
5. Glencora	dis.	6				Leu Rose	5	5	3	5	3
6. Belle Echo	4	3	2	3	2	Gleucora	dis.	6			

Time—2:34½; 2:30; 2:29; 2:30¾; 2:35.

THURSDAY, SEPTEMBER 23D.

RACE NO. 12.—TROTTING.

Stake for two twenty-two class.

NAME AND PEDIGREE OF HORSE.	By Whom Entered.	P. O. Address.
Bateman, by H. Clay; dam, American Star	M. Sailsbury	San Francisco.
Brigadier, by Happy Medium; dam, Lady Turner, by T. Pierce	J. B. McDonald	Marysville.

Position at Start.				*Position at Close of Race.*			
1. Bateman	2	2	2	Brigadier	1	1	1
2. Brigadier	1	1	1	Bateman	2	2	2

Time—2:22¾; 2:23¾; 2:26.

RACE NO. 13.—RUNNING.

Mile dash for two-year olds. Two hundred and fifty dollars added; winners at Oakland and three-quarter dash at this Fair to carry five pounds extra.

NAME AND PEDIGREE OF HORSE.	By Whom Entered.	P. O. Address.
Douglas, by Wildidle; dam, by Norfolk	Geo. Howson	Sacramento.
Laura Winston, by Norfolk; dam, Golden Gate	W. L. Appleby	Carson.
Jim Brown, by Foster; dam, Flush	W. L. Pritchard	Sacramento.
Frank Rhodes, by Leinster; dam, Adi A	W. L. Pritchard	Sacramento.
Duke of Norfolk, by Norfolk; dam, Marion, by Malcom	Theo. Winters	Winters, Yolo.
Fred. Collier, by Joe Hooker; dam, unknown	Theo. Winters	Winters, Yolo.
Belshaw, by Wildidle; dam, Susie W.	J. H. C. Judson	Santa Clara.

Position at Start.	*Position at Close of Race.*	
1. Frank Rhodes	Fred. Collier	1
2. Fred. Collier	Frank Rhodes,	2
3. Laura Winston	Duke of Norfolk	3
4. Duke of Norfolk	Jim Brown	4
5. Belshaw	Belshaw	5
6. Douglas	Douglas	6
7. Jim Brown	Laura Winston	7

Time—1:45½.

RACE NO. 14.—RUNNING.

Free handicap; one and five eighths miles. Two hundred dollars added.

NAME AND PEDIGREE OF HORSE.	By Whom Entered.	P. O. Address.
Snowden, by Bloomsbury; dam, by Norfolk	Geo. Howson	Sacramento.
Imported Australian, by Keepie; dam, Imagination, by Imported Dover	Thos. Jones	Sacramento.
Illusion, by Alarm; dam, Mary Hadley	W. L. Appleby	Carson, Nevada.
Mattie Glen, by Imported Glen Athol; dam, Mattie Gross	Theo. Winters	Winters, Yolo.
Lexington, by Lexington; dam, Volga	E. J. Baldwin	San Gabriel.

Race No. 14—Continued.

Position at Start.		*Position at Close of Race.*	
1. Imported Australian	5	Mattie Glen	1
2. Illusion	4	Snowden	2
3. Mattie Glen	1	Lexington	3
4. Lexington	3	Illusion	4
5. Snowden	2	Imported Australian	5

Time—2:52¾.

Race No. 15—Running.

Stake, two and one-eighth miles dash; five hundred dollars added.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Lena Dunbar, by Leicester; dam, Tibbie Dunbar	W. L. Pritchard	Sacramento.
Neapolitan, by Wardance; dam, Eliza Davis	Theo. Winters	Winters, Yolo Co.
Connor, by Norfolk; dam, Addie C.	Theo. Winters	Winters, Yolo Co.
Clara D., by Imported Glenelg; dam, The Nun	L. P. Martin	San Gabriel.
Jennie B., by Imported Glenelg; dam, Regan	L. P. Martin	San Gabriel.

Position at Start.		*Position at Close of Race.*	
1. Jennie B.	1	Jennie B.	1
2. Connor	2	Connor	2

Time—3:51½.

FRIDAY, SEPTEMBER 24th.

Race No. 16—Trotting.

Two minutes and thirty seconds class. Purse, twelve hundred dollars.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Susie, by Geo. M. Patchen, Jr.; dam, Santa Clara	Robert Beck	Oakland.
Cassie Mack, by McClellan; dam, Sebella	D. McCarty	San Francisco.
Major; unknown	N. A. Covarrubias	Los Angeles.
Crown Point, by Speculation, by Ryodicks, Hambletonian, by Abdella; dam, Young Martha, by Geo. M. Patchen, Jr.; grand dam, Martha Washington, by Burr's Washington	A. B. & L. K. Whipple	San Mateo.
Captain Jenks, by Norfolk; dam, by Belmont	B. Timmons	Hicksville.

Position at Start.				*Position at Close of Race.*			
1. Crown Point	1	1	1	Crown Point	1	1	1
2. Major	dis			Susie	2	2	2
3. Cassie Mack	dis			Cassie Mack	dis		
4. Susie	2	2	2	Major	dis		
5. Captain Jenks	dis			Captain Jenks	dis		

Time—2:28; 2:26¾; 2:28.

Race No. 17—Trotting.

Two minutes and forty seconds class; purse, one thousand dollars; two miles and repeat.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Lady Ellen, by Carr's Mambrino; dam, by Owen Dale	D. J. Green	San Francisco.
Venus, by Venture; dam, unknown	B. Timmons	Hicksville.
Mollie Drew, by Winthrop; dam, Fanny Fern	J. Price	Oakland.
Tom Stout, by The Moore; dam, by Argyle	John Williams	Stockton.
Bessie, by Blackbird; dam, Kate Signal, by Old Signal	J. T. McIntosh	Chico.

Position at Start.				*Position at Close of Race.*			
1. Bessie	dis			Lady Ellen	4	1	1
2. Lady Ellen	4	1	1	Venus	1	2	2
3. Mollie Drew	2	3	3	Mollie Drew	2	3	3
4. Tom Stout	3	4	dis	Tom Stout	3	4	dis
5. Venus	1	2	2	Bessie	dis		

Time—5:04; 5:04½; 5:00.

Race No. 18—Trotting.

Purse, three hundred and sixty dollars; for four-year olds or under.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Capt. Smith, by Locomotive; dam, Maid of Clay	H. R. Covey	Palo Alto.
Sir Guy, by The Moore; dam, by Stormy John	E. L. Mayberry	San Gabriel.
Del Sur, by The Moore; dam, Gretchen, by Mambrino Pilot	L. J. Rose	San Gabriel.

Position at Start.						*Position at Close of Race.*					
1. Capt. Smith	1	2	2	1	1	Capt. Smith	1	2	2	1	1
2. Del Sur	2	1	1	2	2	Del Sur	2	1	1	2	2

Time—2:29; 2:25; 2:28; 2;32; 2:33.

SATURDAY, SEPTEMBER 25th.

Race No. 19—Trotting.

Purse, one thousand dollars; free for all.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Santa Claus, by Stratmore, by Williams' Mambrino	P. A. Finigan	San Francisco.
Nutwood, by Belmont; dam, Miss Russell	J. W. Knox	San José.

Position at Start.						*Position at Close of Race.*					
1. Nutwood	1	2	1	2	2	Santa Claus	2	1	2	1	1
2. Santa Claus	2	1	2	1	1	Nutwood	1	2	1	2	2

Time—2:22; 2:19¾; 2:24½; 2:21¾; 2:21.

Race No. 20—Running.

One half mile scramble.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Laura Winston, by Norfolk; dam, Golden Gate	W. L. Appleby	Carson, Nev.
Countess Zeka, by Norfolk; dam, Ballarena	Theodore Winters	Winters.
May D., by Wildidle; dam, Nettie Brown	J. & H. C. Judson	Santa Clara.

Position at Start.		*Position at Close of Race.*	
1. May D	1	May D	1
2. Laura Winston	3	Countess Zeka	2
3. Countess Zeka	2	Laura Winston	3

Time—0:51.

Race No. 21—Running.

One and three eighths miles dash. For three-year olds.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Wild Idler, by Wildidle; dam, Eva Coombs	P. Goodwin	Los Angeles.
Jack Douglas, by Wildidle; dam, Lady Clair	J. A. Cardinell	San Francisco.
Nighthawk, by imp. Haddington; dam, Napa Queen	J. McM. Shafter	San Francisco.
Sallie Black, by Waterford; dam, Lettie Simpson	P. M. Chatterton	Sacramento.
Tyler, by Wildidle; dam, Lizzie Brown	J. & H. C. Judson	Santa Clara.

Position at Start.		*Position at Close of Race.*	
1. Jack Douglas	5	Sallie Black	1
2. Tyler	3	Nighthawk	2
3. Sallie Black	1	Tyler	3
4. Wild Idler	4	Wild Idler	4
5. Nighthawk	2	Jack Douglas	5

Time—2:24¾.

Race No. 22—Running.

Dash of three miles. Free for all.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Lena Dunbar, by Leinster; dam, Tibbie Dunbar	W. L. Pritchard	Sacramento.
Neapolitan, by Wardance; dam, Eliza Davis	Theodore Winters	Winters.
Connor, by Norfolk; dam, Addie C	Theodore Winters	Winters.
Clara D., by imported Glenelg; dam, The Nun	L. R. Martin	San Gabriel.
Jennie B., by imported Glenelg; dam, Regan	L. R. Martin	San Gabriel.

Position at Start.		*Position at Close of Race.*	
1. Connor	2	Clara D	1
2. Clara D	1	Connor	2

Time—5:33½.

Race No. 23.

Sweetheart against time. For the Society's Gold Medal.

Time, 2:31—Sweetheart, 2:26½.

PREMIUMS AWARDED, 1880.

PREMIUMS AWARDED—1880.

FIRST DEPARTMENT.

Live Stock.	Owner's Name.	Residence.	Name of Animal.	Premium.
CLASS I.—HORSES.				
Best thoroughbred stallion, four years old and over	Theo. Winters	Winters, Yolo Co.	Joe Hooker	$50 00
Best thoroughbred stallion, three years old	Theo. Winters	Winters, Yolo Co.	"Flood"	30 00
Best thoroughbred stallion, two years old	W. L. Pritchard	Sacramento	Clifton Bell	20 00
Best thoroughbred stallion, one year old	Theo. Winters	Winters, Yolo Co.	"305"	15 00
Best colt (stallion), under one year	Theo. Winters	Winters, Yolo Co.	———, dam Addie C.	10 00
Best thoroughbred mare, four years and over, with colt	Theo. Winters	Winters, Yolo Co.	Addie C	40 00
Best thoroughbred mare, four years and over	Theo. Winters	Winters, Yolo Co.	Marion	30 00
Best thoroughbred mare, three years old	W. L. Pritchard	Sacramento	Rosa Lee (filly)	25 00
Best thoroughbred mare, two years old	W. L. Pritchard	Sacramento	———, by Newry	15 00
Best thoroughbred mare, one year old	F. W. Covey, for L. Stanford.	Palo Alto	Belle Boyd (filly)	10 00
Best thoroughbred mare colt, under one year	W. L. Pritchard	Sacramento	———, by Leinster	10 00
FAMILIES.				
Best thoroughbred sire, with not less than five of his colts, all thoroughbred	W. L. Pritchard	Sacramento	Leinster and five colts	50 00
Best thoroughbred dam, with not less than two of her colts, all thoroughbreds	W. L. Pritchard	Sacramento	Addie A	40 00
Best stallion, other than thoroughbred, with not less than five of his colts—open to all	T. W. Covey, for L. Stanford.	Palo Alto	Mohawk Chief and family	50 00
Best dam, other than thoroughbred, with not less than two of her colts	Ben. E. Harris	San Francisco	Lady Silva and colts	40 00
CLASS II.—HORSES OF ALL WORK.				
Best stallion, four years old and over	L. U. Shippee	Stockton	Henry Clay	40 00
Best stallion, three years old	J. P. Odbert	Sacramento	Colonel	30 00
Best stallion, two years old	F. W. Covey, for L. Stanford.	Palo Alto	Bentonia	20 00
Best stallion, one year old	B. E. Harris	San Francisco	Grenadier	15 00
Best mare, four years old	E. Comstock	Yolo County	Poll	40 00
Best mare, four years old and over, with colt	E. Comstock	Yolo County	Coaly and colt	30 00
Best mare, three years old	John Pfau	Petaluma	Lizzie May	20 00
Best mare, two years old	F. W. Covey, for L. Stanford.	Palo Alto	Monte Belle	15 00
Best mare, one year old	Ben. E. Harris	San Francisco	Emma	10 00
Best sucking mare colt	J. B. McDonald	Marysville	Yuba Maid	10 00

CLASS III.—DRAFT HORSES.				
Best stallion, four years old and over	F. J. Hutchinson	Capay, Yolo County	Mark Dunham	40 00
Best stallion, three years old	L. U. Shippee	Stockton	Prince Consort, Jr.	30 00
Best stallion, two years old	William Sparrow	Franklin Township	Plowboy	20 00
Best stallion, one year old	R. J. Merkley	Sacramento	Normandy 2d	15 00
Best mare, four years old and over, with colt	R. J. Merkley	Sacramento	Nellie and colt	40 00
Best mare, four years old and over	E. Comstock	Sacramento	Maud	30 00
Best sucking mare colt	R. J. Merkley	Sacramento	Faucette	10 00
CLASS IV.—ROADSTERS.				
Best stallion, four years old and over	General Sewall	San Francisco	Boccacio	40 00
Best stallion, three years old	W. E. Morris	Stockton	Upright	30 00
Best stallion, two years old	F. W. Covey, for L. Stanford.	Palo Alto	Fallis	20 00
Best gelding, four years old and over	F. W. Covey, for L. Stanford.	Palo Alto	Abe Edgington	30 00
Best mare, four years old and over	M. W. Hicks	Oakland	Fawn	40 00
Best mare, three years old	D. McCarty	Oakland	Carrie F.	30 00
Best mare, two years old	F. W. Covey, for L. Stanford.	Palo Alto	Waxana	20 00
CLASS V.—CARRIAGE HORSES.				
Best matched span, owned and used as such by one person	A. C. Bingham	Black Stat'n, Yolo Co.	John and C. F. Reed	Sil. gob. $40
CLASS VI.—ROADSTER TEAMS.				
Best double team, owned and used as such by one person	D. McCarty	Oakland	Joe and Harry	Sil. gob. $40
CLASS VII.—SADDLE HORSES.				
Best saddle horse, mare, or gelding	Edward Stokes	San Francisco	White Stocking	$20 00
Second best saddle horse, mare, or gelding	Wm. Baudeen	Sacramento	Trim	10 00
CLASS VIII.—SWEEPSTAKES.				
Best stallion	L. H. Titus	San Gabriel	Echo	Sil. pitcher, worth $100
Best mare	Theo. Winters	Winters, Yolo Co.	Mattie A.	Sil. pitcher, worth $100
JACKS.				
Best four years old and over	G. L. Culberson	Capay, Yolo Co.	Kentucky Star	$40 00
Best two years old	Geo. W. Carey	Sacramento	H. W. Beecher	20 00
MULES.				
Best span of mules, any age	W. L. Pritchard	Sacramento	Bay span	25 00

First Department—Continued.

Live Stock.	Owner's Name.	Residence.	Name of Animal.	Premium.
CLASS I.—DURHAM CATTLE.				
Best bull, four years old and over	C. Younger	Forest Home	Red Thorndale	$40 00
Second best bull, four years old and over	John Bidwell	Chico	Osceola	20 00
Best bull, three years old	M. Wick	Oroville	Major Butler	40 00
Second best bull, three years old	John Bidwell	Chico	Duke of Chico	20 00
Best bull, two years old	Chas. Clark	Milpitas	Gwinn Prince	40 00
Second best bull, two years old	R. Ashburner	Baden Station	Baden Duke	20 00
Best bull, one year old	C. Younger	Forest Home	7th Red Thorndale	30 00
Second best bull, one year old	R. Ashburner	Baden Station	Kirklevington Chief	15 00
Best bull calf	J. D. Carr	Gabilan	28th Duke of Gabilan	20 00
Second best bull calf	M. Wick	Oroville	Golden Wreath	10 00
COWS.				
Best cow, four years old and over	J. D. Carr	Gabilan	3d Maid of Monterey	40 00
Second best cow, four years old and over	M. Wick	Oroville	Gem	20 00
Best cow, three years old	C. Younger	Forest Home	2d Red Dolly	40 00
Second best cow, three years old	C. Younger	Forest Home	Jessie Maynard	20 00
Best cow, two years old	C. Younger	Forest Home	5th Red Dolly	40 00
Second best cow, two years old	J. D. Carr	Gabilan	Gabilan Beauty	20 00
Best cow, one year old	J. D. Carr	Gabilan	18th Maid of Monterey	30 00
Second best cow, one year old	C. Younger	Forest Home	6th Rosa Nell	15 00
Best heifer calf	C. Younger	Forest Home	2d Oxford Rose	20 00
Second best heifer calf	J. D. Carr	Gabilan	19th Maid of Monterey	10 00
ALDERNEY AND JERSEY, IN ONE CLASS.				
Best bull, four years old and over	Robert Beck	Oakland	Buffalo Bill	40 00
Best bull, three years old	Henry Pierce	San Francisco	Hugo of Yerba Buena	40 00
Best bull, two years old	E. L. Aiken	Sacramento	Major	40 00
Best bull, one year old	R. Noell	Grass Valley	Highland Prince	30 00
Best bull calf	E. L. Aiken	Sacramento	Bolivia	20 00
COWS.				
Best cow, four years old and over	Henry Pierce	San Francisco	2d Pearl of Yerba Buena	40 00
Best cow, three years old	R. Noell	Grass Valley	Queen	40 00
Best cow, two years old	Henry Pierce	San Francisco	Beauty of Yerba Buena	40 00
Best cow, one year old	J. Askew	El Dorado	Jersey Belle	30 00
Best heifer calf	P. Stanton	Sacramento	Anemone	20 00

DEVONS, HEREFORDS, AYRSHIRES, HOLSTEINS, AND HOLDERNESS, IN ONE CLASS.				
Best bull, three years old and over	George Bement	Redwood	Melanethon Callaghan	40 00
Best bull, one year old	George Bement	Redwood	Archie	30 00
Best bull calf	George Bement	Redwood	Eclipse	20 00
Best cow, three years old and over	George Bement	Redwood	Stellita	40 00
Best cow, two years old	George Bement	Redwood	Stellina	20 00
Best cow, one year old	George Bement	Redwood	Highland Maid	20 00
Best heifer calf	George Bement	Redwood	Marietta	20 00
Best herd of thoroughbred cattle, over two years old, to consist of one male and four females, owned by one person	M. Wicks	Oroville	Major Butler, Gem, Frantic Louan, Venus, Ruby	Sil. pitcher, worth $100
Best herd of thoroughbred cattle, under two years old, to consist of one male and four females, owned by one person	C. Younger	Forest Home	7th Red Thorndale, 6th Rose of Forest Home, 6th Rose Neil, 8th Amelia, Oxford Rose	$60 00
CLASS II.—GRADED CATTLE.				
Best cow, four years old and over	R. Ashburner	Baden Station	Maggie	40 00
Best cow, three years old	R. Ashburner	Baden Station	Lucy	25 00
Best cow, two years old	E. Comstock	Yolo County	Pet	15 00
Best cow, one year old	E. Comstock	Yolo County	Rosa	10 00
Best heifer calf	E. Comstock	Yolo County	Beauty	10 00
Best milch cow	E. Comstock	Yolo County	Missouri	30 00
CLASS III.—SWEEPSTAKES.				
Best bull, any age or breed	C. Younger	Forest Home	2d Duke of Alameda	Sil. Pit'r, $50
Best cow, any age or breed	C. Younger	Forest Home	2d Rose of Forest Home	Sil. Pit'r, 50
Best bull and three calves under one year	C. Younger	Forest Home	Red Thorndale	Sil. Pit'r, 50
CLASS I.—SHEEP—SPANISH MERINO.				
Best ram, two years old and over	E. W. Woolsey	Berkeley	Columella	$30 00
Best ram, one year old and under two	J. H. Strowbridge	Haywards	Sprightly	22 50
Best three ram lambs	E. W. Woolsey	Berkeley	Pen of three lambs	22 50
Best pen, not less than five ewes, two years and over	J. H. Strowbridge	Haywards	Pen of five ewes	22 50
Best pen, not less than five ewes, one and under two years	J. H. Strowbridge	Haywards	Pen of five ewes	22 50
Best pen, not less than five ewe lambs	E. W. Woolsey	Berkeley	Pen of five ewe lambs	22 50
Best ram, and five of his lambs	E. W. Woolsey	Berkeley	Columella and lambs	30 00

FIRST DEPARTMENT—Continued.

LIVE STOCK.	Owner's Name.	Residence.	Name of Animal.	Premium.
CLASS II.—FRENCH MERINO AND SILESIAN.				
Best ram, two years old and over	Mrs. R. Blacow	Centerville	Gladiator	$30 00
Best ram, one year old and under two years	Mrs. R. Blacow	Centerville	Bulger	22 50
Best three ram lambs	Mrs. R. Blacow	Centerville		22 50
Best pen, not lest than five ewes, two years and over	Mrs. R. Blacow	Centerville		22 50
Best pen, not less than five ewes, one year and under two	Mrs. R. Blacow	Centerville		22 50
Best pen, not less than five ewe lambs	Mrs. R. Blacow	Centerville		22 00
Best ram, and five of his lambs	Mrs. R. Blacow	Centerville		30 00
One French Merino sheep, shown with 17 months fleece	Mrs. R. Blacow	Centerville		Prem recm'd
CLASS III. — COTSWOLD, LEICESTERSHIRE, LINCOLNSHIRE, SHROPSHIRE, AND A CROSS BETWEEN ANY TWO THOROUGHBREDS.				
Best ram, two years old and over	C. Younger	Forest Home	Far West	$30 00
Best ram, one year old and under two years	C. Younger	Forest Home		22 50
Best three ram lambs	C. Younger	Forest Home		22 50
Best pen, not less than five ewes, two years and over	C. Younger	Forest Home		22 50
Best pen, not less than five ewes, one year and under two	C. Younger	Forest Home		22 50
Best pen, not less than five ewe lambs	C. Younger	Forest Home		22 50
Best ram, and five of his lambs	C. Younger	Forest Home	Far West	30 00
SWEEPSTAKES.				
Best ram, any age or breed, and five of his lambs	Mrs. R. Blacow	Centerville	Leopard and lambs	50 00
THOROUGHBRED GOATS.				
Best buck, two years old and over	J. S. Harris	Hollister	Pasha	35 00
Best buck under two years old	J. S. Harris	Hollister	Bruce	30 00
Best pen, not less than three does, two years and over	J. S. Harris	Hollister	Highland Mary, Scottish Queen, and Jenny Glenn	35 00
Best pen, not less than three does, under two years	J. S. Harris	Hollister	Pen of does	30 00
GRADED GOATS.				
Best pen, not less than three does, two years and over	J. S. Harris	Hollister	Pen of three does	20 00
Best pen, not less than three does, under two years	J. S. Harris	Hollister	Pen of three does	15 00

SWEEPSTAKES—GOATS.				
Best buck	J. S. Harris	Hollister	Pasha	30 00
Best doe	J. S. Harris	Hollister	Maid of the Mist	20 00
Best pen, not less than ten kids	J. S. Harris	Hollister	Pen of ten kids	20 00
CLASS I.—SWINE—BERKSHIRE.				
Best boar, two years old and over	John Rider	Sacramento	Commodore	30 00
Best boar, under two years old	John Rider	Sacramento	Commodore 2d	20 00
Best boar, six months old and under one year	John Rider	Sacramento	Canute No. 2	15 00
Best breeding sow	Hugh Cove	Yolo County	Nellie	30 00
Best sow, six months old and under one year	M. D. Boruck	San Francisco	Queen Bess	15 00
Best pair pigs, under ten months	E. Comstock	Yolo County	Jake and Bettie	30 00
One boar, three years old and over	E. Comstock	Yolo County	Mike	Premrecm'd
One pair pigs, under ten months	John Rider	Sacramento		Premrec'md
CLASS II.—POLAND, CHINA, AND CHESTER WHITE.				
Best boar, two years old and over	Elias Gallup	Hanford, Tulare Co.	Capt. Jenks	$30 00
Best boar, under two years	Elias Gallup	Hanford, Tulare Co.	Cal. Peerless	20 00
Best boar, six months old, and under one year	Elias Gallup	Hanford, Tulare Co.	Conice	15 00
Best breeding sow	Elias Gallup	Hanford, Tulare Co.	Belladonna	30 00
Best sow, six months old and under one year	Elias Gallup	Hanford, Tulare Co.	Rosalind Starr	15 00
Best pair pigs, under ten months	L. N. Scott	Lincoln	Willie and Flora	30 00
SWINE—SWEEPSTAKES.				
Best boar, any age or breed	John Rider	Sacramento	Commodore	40
Best cow, any age or breed	John Rider	Sacramento	Princess of Woodale	40
Best pen, six pigs of any age or breed	John Rider	Sacramento	Pen of Berkshire pigs	20
Best family, all the same breed, one boar, two sows, and six pigs	John Rider	Sacramento	Commodore, Princess of Woodale, Lady Knapp, and six pigs	25
Pen of six pigs	Hugh Cave	Yolo County		Prem. rec'd.
Pen of six pigs	E. Comstock	Yolo County		Prem. rec'd.
Best pen of six pigs	Hugh Cave	Yolo County		Prem. rec'd.

First Department—Continued.

Description.	Owner.	Address.	Premium.
CLASS III.—POULTRY.			
Best trio Light Brahmas	T. D. Morris	Sonoma	$5 00
Best trio Dark Brahmas	T. D. Morris	Sonoma	5 00
Best trio Buff Cochins	T. D. Morris	Sonoma	5 00
Best trio Partridge Cochins	T. D. Morris	Sonoma	5 00
Best trio White Cochins	T. D. Morris	Sonoma	5 00
Best trio Black Cochins	T. D. Morris	Sonoma	5 00
Best trio Games, any variety	T. D. Morris	Sonoma	5 00
Best trio Golden Spangled Hamburgs	T. D. Morris	Sonoma	5 00
Best trio Silver Spangled Hamburgs	T. D. Morris	Sonoma	5 00
Best trio Black Hamburgs	T. D. Morris	Sonoma	5 00
Best trio White Leghorns	T. Waite	Brighton	5 00
Best trio Brown Leghorns	Mrs L. E. McMahon	Dixon	5 00
Best trio Black Spanish	F. S. George	Sacramento	5 00
Best trio White Dorkings	Elias Gallup	Hanford, Tulare County	5 00
Best trio Silver Gray Dorkings	T. D. Morris	Sonoma	5 00
Best trio Dominiques	T. D. Morris	Sonoma	5 00
Best trio Plymouth Rocks	Mrs. L. E. McMahon	Dixon	5 00
Best trio Black Polish	T. D. Morris	Sonoma	5 00
Best trio Silver Polish	T. D. Morris	Sonoma	5 00
Best trio White Polish	T. D. Morris	Sonoma	5 00
Best trio Houdan French fowls	T. D. Morris	Sonoma	5 00
Best trio Game Bantams	Mrs. L. E. McMahon	Dixon	5 00
Best trio Golden Seabright Bantams	C. W. Rapp	Sacramento	5 00
Best pair Rouen ducks	E. S. Hart	Florin	5 00
Best pair Aylesbury ducks	T. D. Morris	Sonoma	5 00
Best pair Pekin ducks	E. Gallup	Hanford, Tulare County	5 00
Best pair Cayuga ducks	T. D. Morris	Sonoma	5 00
Best pair geese (Bremen)	T. D. Morris	Sonoma	5 00
Best pair geese (Toulouse)	John Rider	Sacramento	5 00
Best pair geese (China)	T. D. Morris	Sonoma	5 00
Eleven Seabright Bantams, all alike	Eddie Earl	Sacramento	Prem. rec'd.
Trio Golden Pheasant Topknots	N. Neil	Sacramento	Prem. rec'd.
Greatest display of poultry	T. D. Morris	Sonoma	Prem. rec'd.

SECOND DEPARTMENT.

MACHINERY, ENGINES, ETC.

Exhibitor.	P. O. Address.	Article Exhibited.	Award.
CLASS I.			
M. R. Rose	Sacramento	Best steam engine	$30 00.
CLASS II.			
M. C. Hawley & Co	Sacramento	Best Buckeye cider mill	Diploma.
M. C. Hawley & Co	Sacramento	Orchard's post-hole auger	Diploma.
M. C. Hawley & Co	Sacramento	Orchard's well auger	$5 00.
Geo. O. Bates & Co	Sacramento	Excelsior hand corn sheller	Diploma.
Geo. O. Bates & Co	Sacramento	President lawn mower	Diploma.
Holman, Stanton & Co	Sacramento	Furst & Bradley's horse hay rake	Diploma.
Baker & Hamilton	Sacramento	Best self-sharpener hay cutter	Diploma.
Baker & Hamilton	Sacramento	Best display of agricultural machinery	$30 00.
Rose & King	Sacramento	Economy sweep horse-power	$10 00.
CLASS III.			
M. C. Hawley & Co	Sacramento	Buckeye wheat drill	Diploma.
M. C. Hawley & Co	Sacramento	Best riding corn cultivator	Diploma.
F. A. Kelley	Sacramento	Best elevator for stacking grain	$10 00.
Batchelor, Van Gelder & Co	Sacramento	Broadcast sowing machine, spring tooth	Prem. recom'd.
Geo. O. Bates & Co	Sacramento	Empire mowing machine	Diploma.
Holman, Stanton & Co	Sacramento	Wood's self-binding harvester	Diploma.
Holman, Stanton & Co	Sacramento	Wood's self-rake reaping machine	Diploma.
Holman, Stanton & Co	Sacramento	La Don pulverizing harrow	Diploma.
D. H. Corthill	Stockton	Spring tooth harrow	Prem. recom'd.
Baker & Hamilton	Sacramento	Hill's header	$40 00.
Baker & Hamilton	Sacramento	Gem broadcast sowing machine	$10 00.
Baker & Hamilton	Sacramento	Horse-power corn planter	Special mention.
Baker & Hamilton	Sacramento	Hand-power corn planter	Special mention.
Baker & Hamilton	Sacramento	Harrow	Diploma.
Baker & Hamilton	Sacramento	Best one-horse cultivator	$5 00.
Baker & Hamilton	Sacramento	Best cultivator	$10 00.
Baker & Hamilton	Sacramento	Horse hoe	Hon. mention.
Baker & Hamilton	Sacramento	Gohram broadcast sowing machine, with cultivator attachment	Diploma.
H. Hellwegan	San Francisco	Best hand corn planter	$2 00.
J. C. Shofner	San Francisco	Sherrill's broadcast sowing machine, with cultivator attachment	Diploma.
A. W. Lockhart	Sacramento	Self-feeder for thrashing machine	Sp'l prem. recmd.
Byron Jackson	San Francisco	Self-feeder for thrashing machine	$10 00.
Byron Jackson	San Francisco	Self-feeder with Bayles' attachment	Hon. mention.
Holman, Stanton & Co.	Sacramento	McCormick's mowing machine	Hon. mention.
William Gutenberger	Sacramento	Best field roller and crusher	$10 00.
CLASS IV.			
M. C. Hawley & Co.	Sacramento	Best platform scales	Diploma.
Rusby & Merry	Chico	Best farm feed mill	$10 00.
D. E. Goldsmith	San Francisco	Iron turbine windmill	Diploma.
H. D. Nash & Co.	Sacramento	Grain separator	Diploma.
J. Klies & Co	Sacramento	Best fanning mill	$5 00.

MACHINERY, ENGINES, ETC.—Continued.

Exhibitor.	P. O. Address.	Article Exhibited.	Award.
H. Brightman	Placerville	Best farm gate	$10 00.
Baker & Hamilton	Sacramento	"Queen of the South" farm feed mill	Hon. mention.
A. D. Miller	Walsh's Station.	Harris windmill	Hon. mention.
CLASS V.			
M. C. Hawley & Co.	Sacramento	Best washing machine	Diploma.
B. Peeler	Mono	Forrest's double acting force pump	Diploma recm'd.
D. E. Goldsmith	San Francisco	Buckeye double acting force pump	Hon. mention.
F. M. Lash	Sacramento	Adjustable fruit gatherer	Diploma.
R. M. Beebee	Gridley	Apparatus for raising water for irrigating purposes	Diploma or silver medal recm'd.
Baker & Hamilton	Sacramento	Revolving road scraper	Diploma.
Baker & Hamilton	Sacramento	Best garden seed drill	Medal.
M. R. Rose	Sacramento	Apparatus fer raising water for irrigating purposes	$10 00.
J. M. Bassaillon	Sacramento	Forest washing machine	Hon. mention.
Henry Hillwegan	San Francisco	Knuckle roller wash'g machine.	Sil. med. recm'd.
J. H. Bunk	San Luis Obispo.	Best fruit dryer	$10 00.
CLASS VI.			
M. C. Hawley & Co.	Sacramento	Knap side-hill plow	$5 00.
M. C. Hawley & Co.	Sacramento	Best one horse plow	Diploma.
Geo. O. Bates & Co	Sacramento	Avery steel plow	Diploma.
Holman, Stanton & Co.	Sacramento	Dynamometer	Diploma.
Baker & Hamilton	Sacramento	Best gang plow	$25 00.
Baker & Hamilton	Sacramento	Best sulky plow	$10 00.
Baker & Hamilton	Sacramento	Best stubble plow	$5 00.
Baker & Hamilton	Sacramento	Best sod plow	$5 00.
Baker & Hamilton	Sacramento	Best subsoil plow	$5 00.
Baker & Hamilton	Sacramento	Best plow for all purposes	$5 00.
Baker & Hamilton	Sacramento	Gale chilled plow	Diploma.
CLASS VII.			
J. F. Hill	Sacramento	Best ladies' phaeton	$10 00.
J. F. Hill	Sacramento	Best display carriage wheels	Diploma.
J. F. Hill	Sacramento	Best gearing of California green timber	Prem. recm'd.
Larken & Co.	San Francisco	Best top buggy	Dip. and $10 00.
Larken & Co.	San Francisco	Best two seated open carriage	$15 00.
Larken & Co.	San Francisco	Best trotting wagon	Dip. and $10 00.
Larken & Co.	San Francisco	Best track sulky	Diploma.
Larken & Co.	San Francisco	Best two-horse family carriage	Dip. and $10 00.
William Newald	San Francisco	Best one-horse family carriage	Dip. and $15 00.
M. J. McClure	San Francisco	Two seated open carriage	Prem. recm'd.
A. Meister	Sacramento	Best spring market wagon	$10 00.
P. J. O'Brien	Sacramento	Best open buggy	$10 00.
Baker & Hamilton	Sacramento	Best farm wagon for general purposes	$10 00.
Baker & Hamilton	Sacramento	Best street goods wagon	Diploma.

Mr. William Newald wishes the fifteen dollars he is to receive as premium for the best one horse family carriage, to be donated to the Protestant Orphan Asylum.

THIRD DEPARTMENT.

TEXTILE FABRICS.

Exhibitor.	P. O. Address.	Article Exhibited.	Award.
CLASS I.			
Mrs. C. Hahn	Sacramento	Best wove bedspread	$5 00.
Mrs. M. A. Hunter	Shingle Springs	Best knit bedspread	$5 00.
Geo. A. Clark & Bro.	San Francisco	Display of O. N. T. spool cotton	Special award recommended.
Weinstock & Lubin	Sacramento	Best display drygoods	$20 00.
Capital Woolen Mills	Sacramento	Best display woolen goods	$50 00.
Capital Woolen Mills	Sacramento	Best display cloth of flax cotton	$5 00.
Capital Woolen Mills	Sacramento	Best display flax cotton	$5 00
Capital Woolen Mills	Sacramento	Best display Mackinaw blankets	$5 00.
Mrs. A. L. Hoyle	Sacramento	Best hearth rug	$5 00.
S. Lipman & Co	Sacramento	Best display fancy goods	$20 00.
Dale & Co.	Sacramento	Best display silk goods	$25 00.
S. J. Nathan &Co.	Sacramento	Best display neckties and bows	Silver medal.
S. J. Nathan & Co.	Sacramento	Best display gentlemen's shirts	Silver medal.
Dale & Co.	Sacramento	Best display stocking yarn	$3 00..
Locke & Lavenson	Sacramento	Best display carpets and rugs	$20 00.
Locke & Lavenson	Sacramento	Best display woolen carpets	Silver medal.
A. Hamburger	Sacramento	Silk and drygoods	Hon. mention.
Tubbs & Co.	San Francisco	Best display of cordage	Silver medal.
CLASS III.			
Mrs. M. A. Morehead	Sacramento	Best embroidered tablespread	$5 00.
Miss Kitty Walther	Sacramento	Best embroidered sofa cushion	$5 00.
Miss Kitty Walther	Sacramento	Best crochet chair tidy	Prem. recom'd.
Miss P. J. Quick	Sacramento	Best pair silk knit stockings	Prem. recom'd.
Miss P. J. Quick	Sacramento	Best pair wool knit stockings	Prem. recom'd.
Mrs. L. L. Landerkin	Sacramento	Best wax figures	Prem. recom'd.
Mrs. J. M. Bisaillon	Sacramento	Best embroidered baby cloak	$5 00.
Miss Nellie Rogers	Sacramento	Best worsted embroidered raised work	Prem. recom'd.
Miss Nellie Rogers	Sacramento	Best embroidered sofa cushion	Prem. recom'd.
Weinstock & Lubin	Sacramento	Best display boys' clothing	$5 00.
Weinstock & Lubin	Sacramento	Best display hats and caps	Silver medal.
Mrs. M. E. Williams	Sacramento	Best lacework (for pillow shams)	Prem. recom'd.
Rosa Waters	Sacramento	Second best patchwork quilt	Prem. recom'd.
Mrs. C. Hahn	Sacramento	Crochet bedspread and pillow shams	Prem. recom'd.
Mrs. H. H. Smith	Sacramento	Best cone work	$5 00.
Mrs. E. Katzenstein	Sacramento	Best display of feathers	$10 00.
Mrs. E. Katzenstein	Sacramento	Best velvet bonnet	$5 00.
Mrs. B. F. Tade	Sacramento	Best worked quilt	$5 00.
Miss Alice Parker	Sacramento	Best wax flowers	$10 00.
Miss Alice Parker	Sacramento	Best feather flowers	Prem. recom'd.
Miss N. Montfort	Sacramento	Best piece silk embroidery	$5 00.
Miss N. Montfort	Sacramento	Best embroidered lady's dress	$10 00.
Miss N. Montfort	Sacramento	Best embroidered handkerchief	$3 00.
Miss N. Montfort	Sacramento	Best braid work	Prem. recom'd.
Miss May Hubbard	San Francisco	Best linen embroidery	$10 00.
Mrs. T. Lynn	Sacramento	Second best knit bedspread	Prem. recom'd.
Mrs. N. D. Goodell	Sacramento	Best knit foot rug	Prem. recom'd.
Mrs. N. D. Goodell	Sacramento	Best tidy in crewel work	$3 00.
Mrs. William Eberhardt	Sacramento	Best silk worked piano-cover	$3 00.
Minnie B. Cross	Woodland	Best fine lace work	$3 00.
Henry Fisher	Sacramento	Moss and cloth picture	Prem. recom'd.
Mrs. C. H. Cummings	Sacramento	Best knit afghan	Prem. recom'd.
Mrs. F. Thoss	Nevada City	Best hand-made lace stockings	Prem. recom'd.
Mrs. Sarah Rhorer	Sacramento	Best knit quilt	Prem. recom'd.
Mrs. J. N. Porter	Sacramento	Best table cover	$5 00.

TEXTILE FABRICS—Continued.

Exhibitor.	P. O. Address.	Article Exhibited.	Award.
Mrs. J. N. Porter	Sacramento	Best embroid'd dressing-gown	$5 00.
Mrs. W. A. Houghton	Sacramento	Best embroidered table cover	Prem. recom'd.
Mrs. W. A. Houghton	Sacramento	Best chenille tidy	Prem. recom'd.
Mrs. W. A. Houghton	Sacramento	Best silk and crewel embroidery	Prem. recom'd.
Mrs. W. A. Houghton	Sacramento	Best lamberquin	$3 00.
Misses Brothers	Sacramento	Best millinery goods	$20 00.
Misses Brothers	Sacramento	Best display artificial flowers	$10 00.
Misses Brothers	Sacramento	Best velvet hat	$5 00.
Misses Brothers	Sacramento	Best silk bonnet	$5 00.
Miss L. St. Clair	Vallejo	Best worsted work chair and back	$10 00.
Miss Belle Felter	Sacramento	Largest and best display of fancy articles	$15 00.
Miss Belle Felter	Sacramento	Best Ottoman cover	$5 00.
Miss Belle Felter	Sacramento	Best chair stripe and cushion	$5 00.
Miss Belle Felter	Sacramento	Best embroidered sofa cushion	$5 00.
Miss Belle Felter	Sacramento	Best and handsomest toilet set	$5 00.
Miss Belle Felter	Sacramento	Best chenile work	$5 00.
Miss Belle Felter	Sacramento	Three fancy boxes	Prem. recom'd.
Mrs. R. O. Cravens	Sacramento	Best crochet shawl	$5 00.
Miss A. Benedict	Oakland	Best child's afghan	$5 00.
Mrs. Miller	Sacramento	Best white quilt	$5 00.
Miss Addie Wells	Sacramento	Macrame lace work	Prem. recom'd.
Miss Eugenia Excoffier	San Francisco	Best display crochet work	Prem. recom'd.
Mrs. H. H. Pierson	Sacramento	Best display wax autumn leaves	$3 00.
Mrs. H. H. Pierson	Sacramento	Best bead embroidery work	$5 00.
Mrs. H. H. Pierson	Sacramento	Best skeleton leaves	$3 00.
Mrs. F. C. Neal	Sacramento	Best patchwork quilt	$5 00.
Mrs. T. L. Acock	Sacramento	Best silk quilt	$5 00.
Mrs. E. B. Hunt	Sacramento	Best worked quilt	$5 00.
Mrs. M. M. Sickler	San Diego	Display of fine hand-made lace work	Prem. recom'd.
Mrs. G. Marks	Sacramento	Best embroidered picture	$10 00.
H. C. Megerlie	Sacramento	Best display ornamental grasses	$3 00.
JUVENILE DEPARTMENT.			
Miss N. B. Lawson, 11 yrs	Sacramento	Best hand sewing	Silver medal.
Leslie Trowbridge, 17 yrs	Sacramento	Twine hammock	Prem. recom'd.
Alice Grover	Sacramento	Best crayon drawing	Prem. recom'd.
Ida Lenoir, 6 years Maud Lenoir, 8 years	Sacramento	Best toilet set	Prem. recom'd.
Addie Durson, 4 years	Sacramento	Best woven mats	Prem. recom'd.
Katie Meister	Sacramento	Best fancy pillow-shams	Prem. recom'd.
Phebe C. Brown, 12 years	Sacramento	Fine patchwork footstool	Prem. recom'd.
Howard Bassett, 13 years	Sacramento	Best display carving	Prem. recom'd.
Mary E. Aitken, 14 years	Sacramento	Largest display fancy articles	Prem. recom'd.
Gertrude Miller	Sacramento	Five knit worsted mats	Prem. recom'd.
CLASS IV.			
M. Ostrom	Sacramento	Portrait medallion	See 7th Dep't.
T. B. Johnson	San Francisco	Display plain and ornamental penmanship	Hon. mention.
Frederick Flohr	Sacramento	Marble statuary	Silver medal recommended.
J. J. Lissen	Sacramento	Best display card printing	Special award recommended.
Dale & Co.	Sacramento	Best display sheet music printed in California	Silver medal.

FOURTH DEPARTMENT.

MECHANICAL PRODUCTS.

Exhibitor.	Address.	Article Exhibited.	Award.
CLASS I.			
Main & Winchester	San Francisco	Best set double harness	Sil. med.&$20 00.
Main & Winchester	San Francisco	Best set single harness	$10 00.
Main & Winchester	San Francisco	Best display saddles and bridles	Silver medal.
Main & Winchester	San Francisco	Best display Mexican saddles	$5 00.
Main & Winchester	San Francisco	Best display saddle-trees	Diploma.
Weinstock & Lubin	Sacramento	Best display soft hats	$5 00.
Weinstock & Lubin	Sacramento	Best leather gloves and mittens	Silver medal.
Weinstock & Lubin	Sacramento	Best men and boys' shoes	Silver medal.
Weinstock & Lubin	Sacramento	Best ladies' and girls' shoes	Silver medal.
J. Sullivan	Sacramento	California-tanned leather	Silver medal.
S. J. Nathan & Co.	Sacramento	Best display trunks, etc.	Sil. med.&$10 00.
S. J. Nathan & Co.	Sacramento	Best carpet bags	Diploma.
James Parsons	Sacramento	Best pair ladies' slippers	$3 00.
James Parsons	Sacramento	Best pair ladies' gaiters	$3 00.
James Parsons	Sacramento	Best pair ladies' bootees	$3 00.
John Utschig	San Francisco	Best pair gent's dress boots	$5 00.
John Utschig	San Francisco	Best pair gent's heavy boots	$5 00.
John Utschig	San Francisco	Best pair gent's dress shoes	$5 00.
John Utschig	San Francisco	Best pair gent's congress gaiters	$5 00.
CLASS II.			
Main & Winchester	San Francisco	Saddlers' hardware	$10 00.
Scott & Muir	Sacramento	Best display of gas fixtures and lamps	Dip. and $10 00.
L. L. Lewis & Co.	Sacramento	Best display copper work	$10 00.
L. L. Lewis & Co.	Sacramento	Best display tinware	Silver medal.
Z. Fetterby	Yolo County	Best patent beer tap	Special notice.
W. K. Vanderslice & Co.	San Francisco	Best display silver ware	Dip. and $25 00.
George T. Bush & Co.	Sacramento	Display of copper work	$10 00.
George T. Bush & Co.	Sacramento	Best display brass work	$10 00.
George T. Bush & Co.	Sacramento	Best display of plumbers' goods and wares	Silver medal.
George T. Bush & Co.	Sacramento	Best display of chandeliers and burners	$10 00.
G. W. Shreve	San Francisco	Best display of worked iron and steel	$10 00.
G. W. Shreve	San Francisco	Best engraving on steel	Diploma.
G. W. Shreve	San Francisco	Best display of shot	$5 00.
George Duden	Lake House	Best display pruning shears	$5 00.
CLASS III.			
Capital Gas Works	Sacramento	Model of Capital Gas Works	Rec. spec'l men.
Capital Gas Works	Sacramento	Best display gas stores	$5 99.
L. L. Lewis & Co	Sacramento	Best cooking stove, for wood	$5 00.
L. L. Lewis & Co	Sacramento	Best cooking stove, for coal	$5 00.
L. L. Lewis & Co	Sacramento	Best parlor stove	$5 00.
L. L. Lewis & Co	Sacramento	Best cooking range	$10 00.
L. L. Lewis & Co	Sacramento	Best display hollow ware	$5 00.
L. L. Lewis & Co	Sacramento	Best fruit and flower stand	$5 00.
L. L. Lewis & Co	Sacramento	Best portable range	$5 00.
Aitken & Fish	Sacramento	Best hot-air parlor grate	$3 00.
CLASS IV.			
Sherman, Hyde & Co	San Francisco	Best piano made in California	$20 20.
L. K. Hammer	Sacramento	Best display musical instruments	Sil. med. & $20 00.
CLASS V.			
The J. M. Brunswick & Balke Company	San Francisco	Best display billiard tables	$10 00.

Mechanical Products—Continued.

Exhibitor.	P. O. Address.	Article Exhibited.	Award.
J. G. Davis	Sacramento	Best writing desk	$5 00.
J. G. Davis	Sacramento	Best sick chair	$5 00.
J. G. Davis	Sacramento	Office desk	Silver medal rec.
J. G. Davis	Sacramento	Display upholstery	Silver medal rec.
Pacific Spring & Mattress Company	San Francisco	Best dressing bureau	$10 00.
Pacific Spring & Mattress Company	San Francisco	Best spring bed	$5 00.
Pacific Spring & Mattress Company	San Francisco	Best set bedroom furniture	$10 00.
Pacific Spring & Mattress Company	San Francisco	Best display California wood	$10 00.
John Cordano	Sacramento	Fancy box, made with penknife	Spec'l prem. rec.
B. F. Farrar	San Francisco	Large display spring beds	Diploma rec'd.
B. F. Farrar	San Francisco	Best display mattresses	$5 00.
Mrs. J. Kindleberger	San Francisco	Patent pillow sham holder	Hon. mention.
George A. Fuller	San Francisco	Best school furniture	$10 00.
George A. Fuller	San Francisco	Best folding settees	Dip. recom'd.
George A. Fuller	San Francisco	Mallick's tellurion	Hon. mention.
Haywood & Co.	San Francisco	Best display rattan furniture	Dip. & spec. premium recom'd.
Haywood & Co.	San Francisco	Best center table	$5 00.
Trumas S. Clark & Co.	San Francisco	Best parlor folding bed	Hon. mention.
Trumas S. Clark & Co.	San Francisco	Display spring wire mattresses	Sil. med. reco'd.
Trumas S. Clark & Co.	San Francisco	Display iron gaspipe bedsteads	Dip. recom'd.
James H. Archer	Madison, Yolo	Patent invalid bed	Dip. recom'd.
John Breuner	Sacramento	Best sofa	$10 00.
John Breuner	Sacramento	Best lounge	$5 00.
John Breuner	Sacramento	Best office chair	$5 00.
John Breuner	Sacramento	Best set parlor chairs	$10 00.
John Breuner	Sacramento	Best set parlor furniture	$20 00.
John Breuner	Sacramento	Best display furniture	$20 00.
John Breuner	Sacramento	Best bookcase	$5 00.
John Breuner	Sacramento	Best wardrobe	$10 00.
John Breuner	Sacramento	Best display upholstery	$10 00.
John Breuner	Sacramento	Best office desk	$5 00.
S. P. Sorenson	Rio Vista	Sorensen's patent chair brace	Sil. med. reco'd.
Gilbert & Moore	San Francisco	Best display school furniture	Dip. recom'd.
Gilbert & Moore	San Francisco	Display office desks	Sil. med. reco'd.
CLASS VI.			
Billingsly & Co.	Sacramento	Best display wooden ware	$25 00.
Billingsly & Co.	Sacramento	Best cedar ware	$5 00.
Billingsly & Co.	Sacramento	Best pine ware	$5 00.
Billingsly & Co.	Sacramento	Best oak ware	$5 00.
Billingsly & Co.	Sacramento	Best splint-wood baskets	$3 00.
Billingsly & Co.	Sacramento	Best osier willow baskets	$5 00.
Billingsly & Co.	Sacramento	Best broom corn, brooms, and brushes	$10 00.
Edward H. Krause	Sacramento	Best display scroll sawing	$5 00.
R. Dale & Co.	Sacramento	Best display willow ware	$10 00.
William Eberhardt	Sacramento	Display oak ware	Meritorious.
William Eberhardt	Sacramento	Display turning work	Recom'd special premium.
William Eberhardt	Sacramento	Display carving	
William Eberhardt	Sacramento	Display ivory work	
CLASS VII.			
Pulvermacher Galvanic Co.	San Francisco	Electric belts, bands, etc.	Sil. medal recm'd.
W. O. Thrailkill	Sacramento	Display dental goods and instruments	Diploma.
Geo. W. Shreve	San Francisco	Best game bag	$3 00.
Geo. W. Shreve	San Francisco	Best breach-loading shotgun	$5 00.
Geo. W. Shreve	San Francisco	Best display firearms, California manufacture	Silver medal.
Geo. W. Shreve	San Francisco	Best display firearms, American make	Dip. recom'd.

Mechanical Products—Continued.

Exhibitor.	P. O. Address.	Article Exhibited.	Award.
Geo. W. Shreve	San Francisco	Best double-barreled shotgun	$5 00.
Cal. Elastic Truss Co.	San Francisco	Best display elastic trusses	Diploma.
Electro Magnetic Belt Co.	San Francisco	Best display galvanic belts	Silver medal.
William Eberhardt	Sacramento	Best sporting rifle	$5 00.
R. A. Fish	Sacramento	Best electric machine	Diploma.
R. A. Fish	Sacramento	Best galvanic battery and apparatus	Diploma.
CLASS VIII.			
Whittier, Fuller & Co.	Sacramento	Best Prussian blue	$5 00.
Whittier, Fuller & Co.	Sacramento	Best copal varnish	$5 00.
Whittier, Fuller & Co.	Sacramento	Best glue	$5 00.
Whittier, Fuller & Co.	Sacramento	Best prussiate of potash	$5 00.
Whittier, Fuller & Co.	Sacramento	Best linseed oil	$5 00.
Whittier, Fuller & Co.	Sacramento	Best white lead	$5 00.
Whittier, Fuller & Co.	Sacramento	Best lard oil	$5 00.
Whittier, Fuller & Co.	Sacramento	Best lubricating oil	Dip. recom'd.
Whittier, Fuller & Co.	Sacramento	Best illuminating oil	Dip. recom'd.
Whittier, Fuller & Co.	Sacramento	Best display paints, California manufacture	Dip. recom'd.
Whittier, Fuller & Co.	Sacramento	Best display stained glass	Dip. recom'd.
Whittier, Fuller & Co.	Sacramento	Best display ground glass	Dip. recom'd.
B. B. Scott & Son	Sacramento	Best display writing fluid	$2 00.
B. B. Scott & Son	Sacramento	Best yeast cake	Dip. recom'd.
C. C. Burr & Co	San Francisco	Samples of mustard and spices	Dip. recom'd.
C. C. Burr & Co	San Francisco	Best salad oil	Dip. recom'd.
C. C. Burr & Co	San Francisco	Nutrient phosphate and sugar of malt	Dip. recom'd.
C. W. Rapp & Co	Sacramento	Display Japan tea	Dip. recom'd.
Withington & Bagley	Sacramento	Best display soap	Silver medal.
Withington & Bagley	Sacramento	Best bleaching soap	Dip. recom'd.
Royal Baking Powder Co	New York	Display baking powder	Dip. recom'd.
CLASS IX.			
Henry Fisher	Sacramento	Display confectionery	Diploma.
W. F. Peterson	Sacramento	Display candy	$10 00.
Hobby & Smith	Sacramento	Best Rockingham ware	Diploma.
Hobby & Smith	Sacramento	Best stoneware	Diploma.
Hobby & Smith	Sacramento	Best drain tile	$5 00.
Hobby & Smith	Sacramento	Best terra cotta	Diploma.
Hobby & Smith	Sacramento	Best fire brick	$3 00.
Hobby & Smith	Sacramento	Best pottery, various kinds	Silver medal.
Terrance Duffy	San Francisco	Display stoneware	$10 00.
CLASSES X AND XI.			
H. C. Megerlie	Sacramento	Best display representing the ornithology of California	Silver medal.
H. C. Megerlie	Sacramento	Best display California grasses	Silver medal.
Aitken & Fish	Sacramento	Best collection of polished California marble work	Diploma.
Aitken & Fish	Sacramento	Best carved marble mantel	Silver medal.

FIFTH DEPARTMENT.

Exhibitor.	Address.	Article Exhibited.	Award.
CLASS I.			
George Spiker	Sacramento	Best display California tobacco	Silver medal.
George Spiker	Sacramento	Best display California tobacco (manufactured)	Dip. and $10 00.
George Spiker	Sacramento	Best display cigars of California tobacco	Dip. and $10 00.
S. Tryon	Sacramento	Best bale California cotton	$50 00.
CLASS II.			
John Bidwell	Chico	Best flour	$10 00.
John Bidwell	Chico	Best wheat, in head	$5 00.
John Bidwell	Chico	Best two varieties of Tuscan and Genesee wheat	$10 00.
Myrtie Dixon	Sacramento	Best display garden seeds	$10 00.
A. B. Gilbert	Brighton	Best bushel shelled corn	$5 00.
O. D. Lovdall	Sacramento	Best display hops	Silver Medal.
CLASS III.			
A. B. Gilbert	Brighton	Best dozen sweet corn, green	$3 00.
A. B. Gilbert	Brighton	Best three Mountain Sweet watermelons	$2 00.
Wilson Hatch	Virginia City	Display white potatoes	Spec. prem. rec.
F. Bable	Sacramento	Best six cucumbers	$2 00.
A. L. Tryon	Sacramento	Best six marrow squashes	$3 00.
Mrs. M. Spragne	Sacramento	Best six crookneck squashes, new variety	Spec. prem. rec.
G. T. Bascom	Sacramento	Best peck tomatoes	$3 00.
G. T. Bascom	Sacramento	Best six crookneck squashes	$3 00.
G. T. Bascom	Sacramento	Best six Hubbard squashes	$3 00.
G. T. Bascom	Sacramento	Best six turnip beets	$3 00.
G. T. Bascom	Sacramento	Best six sugar beets	$3 00.
Phillip Brussi	Sacramento	Best one half bushel red potatoes	$5 00.
Phillip Brussi	Sacramento	Best one half bushel white potatoes	$5 00.
Phillip Brussi	Sacramento	Best six long blood beets	$3 00.
Phillip Brussi	Sacramento	Best six drumhead cabbage	$3 00.
Phillip Brussi	Sacramento	Best six Dutch cabbage	$3 00.
Phillip Brussi	Sacramento	Best six heads lettuce	$2 00.
Phillip Brussi	Sacramento	Best one half peck yellow onions	$3 00.
Phillip Brussi	Sacramento	Best one half peck peppers, for pickling	$3 00.
Phillip Brussi	Sacramento	Best twelve roots salsify	$3 00.
Phillip Brussi	Sacramento	Best six stalks celery	$3 00.
Phillip Brussi	Sacramento	Best one half peck pole beans	$2 00.
Phillip Brussi	Sacramento	Best one half peck gherkin cucumbers	$3 00.
Phillip Brussi	Sacramento	Best three purple egg plants	$3 00.
E. B. Hunt	Sacramento	Best two pumpkins for pies	$3 00.
G. T. Bascom	Sacramento	Best one half peck garden peas	$3 00.
D. McGregor	Sacramento	Best three watermelons	$3 00.
Felice Gabrielle	Sacramento	Best one half bushel potatoes, variety	$5 00.
Felice Gabrielle	Sacramento	Best one half bushel Irish potatoes	$5 00.
Felice Gabrielle	Sacramento	Best one half bushel sweet potatoes	$5 00.
Felice Gabrielle	Sacramento	Best twelve parsnips	$3 00.
Felice Gabrielle	Sacramento	Best twelve carrots	$3 00.
Felice Gabrielle	Sacramento	Best six heads cabbage	$3 00.
Felice Gabrielle	Sacramento	Best three heads cauliflower	$3 00.

Fifth Department—Continued.

Exhibitor.	P. O. Address.	Article Exhibited.	Award.
Felice Gabrielle	Sacramento	Best three heads broccoli	$3 00.
Felice Gabrielle	Sacramento	Best one half peck white onions	$3 00.
Felice Gabrielle	Sacramento	Best three green fleshed muskmelons	$3 00.
Felice Gabrielle	Sacramento	Best one half peck Lima beans	$3 00.
Felice Gabrielle	Sacramento	Best one half peck dry white beans	$3 00.
Felice Gabrielle	Sacramento	Best one half peck dry field peas	$3 00.
Felice Gabrielle	Sacramento	Best variety dry peas	$3 00.
Felice Gabrielle	Sacramento	Best one half peck castor oil beans, dry	$3 00.
Felice Gabrielle	Sacramento	Best table of vegetables	$20 00.
W. C. Hall	Lodi, San Joaquin County	Best eight Golden Sweet watermelons	Spec. prem. rec.
CLASS IV.			
Thomas O'Brien	Sacramento	Best cut flowers	$10 00.
T. Luderman	San Francisco	Best variety new and rare plants	$10 00.
F. A. Ebel	Sacramento	Best display ornamental foliage plants	$20 00.
F. A. Ebel	Sacramento	Best variety of plants suitable for greenhouse	$15 00.
F. A. Ebel	Sacramento	Best display of bouquets	$10 00.
Frank Kuntz	Sacramento	Best variety of flowering plants in bloom	$20 00.
Frank Kuntz	Sacramento	Best variety roses in bloom	$10 00.
Frank Kuntz	Sacramento	Best varieties fuchsias in bloom	$10 00.
Terrance Duffy	San Francisco	Best display hanging baskets containing flowers	$5 00.
CLASSES V AND VI.			
Mrs. E. F. Aiken	Sacramento	Best domestic brown bread	$5 00.
J. B. Jewell	Sacramento	Best cheese, under one year old	$10 00.
W. H. Lowell	Sacramento	Best cheese, four years old	$10 00.
A. J. Ryder & Russell	Galt	Best and largest display of cheese.	Diploma & $15 00.
Mrs. W. F. Hicks	Sacramento	Best soda biscuit	$2 00.
Mrs. H. Cronkite	Brighton	Best rye bread	$5 00.
Mrs. H. Cronkite	Brighton	Best wheat bread	$5 00.
Mrs. H. Cronkite	Brighton	Best raised soda biscuit	$2 00.
Mrs. W. Bassett	Sacramento	Best display butter in rolls	$15 00.
James Askew	El Dorado	Best twenty-five firkins butter, three months old	$15 00.
Mrs. W. F. Hicks	Sacramento	Best domestic corn bread	$5 00.
Mrs. F. P. Lowell	Sacramento	Best display domestic bread	$10 00.
Clara A. Murphy	Sacramento	Best display biscuit	$2 00.
Mrs. W. F. Peterson	Sacramento	Best display bakers' bread	$3 00.

CLASS II.—FLOUR AND GRAIN.

SPECIAL REPORT OF COMMITTEE ON FLOUR AND GRAIN.

To the State Board of Agriculture:

Your Committee on Flour and Grain beg leave to report that they have made the following awards:

Best sample of flour—John Bidwell.

Greatest variety of wheat in ear or head—John Bidwell.

Best sample of hops—O. D. Lovdall.

Samples of corn, seeds, etc., on exhibition, were not in sufficient quantities to enable the committee, under the rules of the society, to award premiums, but were excellent in character and quality, especially several varieties of garden seeds raised by Myrtie Dickinson, a young girl thirteen years of age.

The committee, being restricted to giving a premium for the best two varieties of wheat, unhesitatingly award it to the Tuscany and Genesee varieties, the best exhibit of which was by

John Bidwell. The committee are of the opinion that they contain within themselves the weight, elements, and general character that constitute the best bread-making wheat—the most profitable for the farmer to raise, the miller to grind, and, not the least important, the consumer to buy—but, in so stating, wish to add that the varieties known as Propo, Australian, Club, and Sonora, exhibited by G. W. Colby, were the best of their kinds on exhibition, and the white Chile and Tuscany, of H. Cronkite, very fine also.

The exhibit of the different varieties of corn, made by John Bidwell, shows to what perfection that valuable grain has attained. The quantities were too small for a premium, and hence we award the premium for the best bushel to H. B. Gilbert.

There were bales of hops in competition for the first premium, placed by Messrs. Daniel Flint, Flint & Lehmen, O. D. Lovdall, and A. Mouton, all of which were of so superior a character that the committee found much difficulty in making an award, but concluded that the bale of O. D. Lovdall was entitled to the first premium, and so awarded.

M. Waterman & Co. placed three varieties of imported Australian wheat for inspection, which the committee reported to be very superior; and, in view of the great importance of our grain interests, recommend to our farmers to frequently obtain their seed wheat from abroad, as one of the best means of insuring the permanent superiority of our California wheat.

The College of Agriculture of the University of California exhibits one hundred and thirty-two varieties of cereal grains, without irrigation, on the experimental grounds at Berkeley, Alameda. Of these, eighty-six varieties are of wheat, thirty-two of barley, thirteen of rye, and one of oats. This is a part of the collection brought together for the purpose of illustrating lectures before the students in agriculture. In response to a call for contributions of specimens of grains grown in the State, numerous contributions have been received of grain in the head, accompanied with the clean-thrashed product. The greater number of varieties, however, were bought of a reputable seed house in Erfut, Germany. More than one hundred kinds were thus secured in one importation. The quantity of each was but small, so that the cost was very light compared with the benefit which will be derived from them by the farmers of the State. It is the intention of those in charge of the College of Agriculture to devise some efficient method of distributing the most promising of these grains among the most practical farmers of the State, as soon as seed can be spared for that purpose. It is expected that it will take some time to acclimatize grains brought from the moist climate of Europe to our comparatively dry one. The barley specimens bear out the reputation for hardiness of that plant, and show that the climate of Berkeley is well suited to their vigorous growth, although critical judges may say that the location is too near the coast to give the best color. The ryes come next in quality, but will probably be improved in the future. There is but one specimen of oats—the Black Tartar—and that shows a vigorous growth. Of the other varieties of oats grown, some were very promising, and all will be tried again on the University grounds, and also sent to the true oat-growing region of the State on the northern coast. The wheats have in general much handsomer heads than the original imported ones which were shown at the State Fair last season. Most of the thrashed specimens are wanting in plumpness, and show that they were Winter wheats in Europe.

Your committee take this opportunity of commending the praiseworthy exertions of the Professor of Agriculture of the State University and his aids for the valuable experiments they have made in this department, which must result in great good to our State, and will in time be one of the most important aids in producing those kinds of cereals best adapted to our climate, thus enriching our own people and benefiting the whole world. While, as a committee to make awards for the best exhibits, it may be regarded as inappropriate to make suggestions outside of the direct line of their duties, they will venture to remark that many complaints have been made here, and what is of more consequence, in Europe, that too little attention is paid to the proper harvesting of our wheat, whereby gravel, quartz, and dirt is permitted to be shipped, sacked, and sold as wheat. While it is not a supposable case that any farmer would knowingly permit such an unwise piece of carelessness, it has all the effect of an intentional fraud with the foreign purchaser, and though the most of our farmers will and do use all efforts to prevent it, the indiscreet carelessness, or, perhaps, dishonesty, of a few, does every grain grower of our State a great injury—one that may, indeed, lead to a permanent loss to the whole State. One cause assigned for this is said to be the great extent of land cultivated by individuals, amounting to many thousands of acres in some instances. It is urged that on such farms harvesting is necessarily hurried, and proper care cannot be taken for want of time. If this be so, then it is very desirable that the era of smaller farms, and a larger number of farms, may soon arrive.

L. WILLIAMS,
J. R. WATSON,
J. W. B. MONTGOMERY,
Committee.

SIXTH DEPARTMENT.

GREEN FRUIT.

Exhibitor.	Address.	Article Exhibited.	Award.
CLASS I.			
P. H. Murphy	Brighton	Best twelve varieties of pears	$10 00.
A. Mouton	Sacramento	Best three varieties of apples	$3 00.
Williamson & Co.	Sacramento	Best display of apples	Prem. recom'd.
Williamson & Co.	Sacramento	Best six varieties of apples	$5 00.
Williamson & Co.	Sacramento	Best display of pears	Prem. recom'd.
Williamson & Co.	Sacramento	Best six varieties of pears	$5 00.
Williamson & Co.	Sacramento	Best display of peaches	$10 00.
Williamson & Co.	Sacramento	Best six varieties of peaches	$5 00.
Williamson & Co.	Sacramento	Best display of plums	$5 00.
Williamson & Co.	Sacramento	Best display of tropical fruits	$40 00.
Williamson & Co.	Sacramento	Best display of oranges	$10 00.
Williamson & Co.	Sacramento	Best display of lemons	$10 00.
Williamson & Co.	Sacramento	Best display of seedling fruits	Spec'l prem. rec.
I. S. Bamber	Placerville	Best sixteen varieties of apples	Spec'l prem. rec.
I. S. Bamber	Placerville	Best twenty varieties of peaches	Spec'l prem. rec.
I. S. Bamber	Placerville	Best display of green figs	$3 00.
I. S. Bamber	Placerville	Best variety of seedling fruits	$10 00.
Thomas Hardie	Placerville	Best three varieties of peaches	$3 00.
W. H. Jessup	Haywards	Best variety of plumes (prunes)	Spec'l prem. rec.
W. H. Jessup	Haywards	Twelve varieties of apples	Spec'l prem. rec.
W. H. Jessup	Haywards	Five varieties of plums	Spec'l prem. rec.
A. F. Hatch	Cordelia, Solano County	Best three varieties of pears	$3 00.
John Bidwell	Chico, Butte Co.	Best twelve varieties of apples	$10 00.
John Bidwell	Chico, Butte Co.	Best twelve varieties of pears	$10 00.
John Bidwell	Chico, Butte Co.	Best display of fruit by producer	$20 00.
CLASS II.			
Mrs. E. S. Hart	Sacramento	Best six jars blackberry jam	$5 00.
Mrs. E. S. Hart	Sacramento	Best jar brandy peaches	$5 00.
Mrs. H. Cronkite	Brighton	Best display canned fruit	$10 00.
Mrs. H. Cronkite	Brighton	Best display of preserves	$10 00.
Mrs. H. Cronkite	Brighton	Best six jars red currant jelly	$5 00.
Mrs. H. Cronkite	Brighton	Best six jars raspberry jelly	$5 00.
Mrs. H. Cronkite	Brighton	Best six jars black currant jelly	$5 00.
Mrs. H. Cronkite	Brighton	Best twelve jars blackberry jelly.	$5 00.
Mrs. H. Cronkite	Brighton	Best six jars strawberry jelly	$5 00.
Mrs. H. Cronkite	Brighton	Best display of pickles	$5 00.
Mrs. William Bassett	Sacramento	Best six glasses raspberry jam	$5 00
Mrs. L. E. McMahon	Sacramento	Best three jars sweet cucumber pickles	Spec'l prem. rec.
Mrs. L. E. McMahon	Sacramento	Best three jars sweet peach pickles	Spec'l prem. rec.
Mrs. L. E. McMahon	Sacramento	Best three jars sweet quince pickles	Spec'l prem. rec.
Mrs. L. E. McMahon	Sacramento	Best twelve bottles olive oil	Spec'l prem. rec.
Mrs. J. R. Lawrie	Santa Clara	Best twelve jars assorted fruit	Spec'l prem. rec.
Miss Mattie Hunt	Washington, Yolo County	Best six jars quince jelly	$5 00.
CLASS III.			
Mrs. E. F. Aiken	Sacramento	Best twenty-five pounds dried plums	$5 00.
Mrs. E. S. Hunt	Florin	Best twenty-five pounds dried pears	$5 00.
Mrs. E. S. Hunt	Florin	Twenty-five pounds dried apples	Spec'l prem. rec.
Mrs. E. S. Hunt	Florin	Twenty-five pounds dried figs	Spec'l prem. rec.

GREEN FRUIT—Continued.

Exhibitor.	P. O. Address.	Article Exhibited.	Award.
Mrs. H. Cronkite	Brighton	Best twelve varieties dried berries	$5 00.
Mrs. J. R. Lawrie	Placerville	Best twenty-five pounds dried apples	$5 00.
Mrs. J. R. Lawrie	Placerville	Best twenty-five pounds dried apricots	$5 00.
I. S. Bamber	Placerville	Best ten pounds dried figs	$5 00.
John Bidwell	Chico	One box sun-dried apples	$5 00.
W. H. Jessup	Haywards	Eight boxes dried plums	$5 00.

MISCELLANEOUS EXHIBITS.

SHIPPING CRATES.			
Cooke & Son	Sacramento	Best package for shipping fruit	$5 00.
Cooke & Son	Sacramento	Best pkg for shipping grapes	$5 00.
Cooke & Son	Sacramento	Best pkg for shipping peaches	$5 00.
Cooke & Son	Sacramento	Best pkg for shipping plums	$5 00.
Cooke & Son	Sacramento	Best pkg for shipping pears	$5 00.
GRAPES.			
P. H. Murphy	Brighton	Best six varieties table grapes	$5 00.
P. H. Murphy	Brighton	Best twelve varieties wine grapes	$15 00.
Mrs. H. Cronkite	Brighton	Best three varieties table grapes	$3 00.
R. S. Locket	Brighton	Best six varieties wine grapes	$5 00.
R. S. Locket	Brighton	Best three varieties raisin grapes	$3 00.
R. S. Locket	Brighton	Best display of grapes	$20 00.
Thomas Hardee	Placerville	Best display of raisins	Spec. prem. rec.
Thomas Hardee	Placerville	Best variety of raisin grapes	$10 00.
James Rutter	Florin	Best variety of raisins	$15 00.
James Rutter	Florin	Best twelve var. table grapes	$15 00.
BRANDY, WINE, ETC.			
Geo. W. Chesley	Sacramento	Best rock and rye	Spec. prem. rec.
Geo. W. Chesley	Sacramento	Best peach and honey	Spec. prem. rec.
Johnson Brandy and Wine Manufacturing Co.	Sacramento	Best grape brandy	$15 00.
Johnson Brandy and Wine Manufacturing Co.	Sacramento	Best sherry wine	$15 00.
Johnson Brandy and Wine Manufacturing Co.	Sacramento	Best angelica wine	$15 00.
Johnson Brandy and Wine Manufacturing Co.	Sacramento	Best Muscatelle wine	Premium rec.
Brighton Distillery	Brighton	Best port wine	$15 00.
Mrs. S. Cronkite	Brighton	Best white wine	$15 00.
Davis Sewing Machine Co.	San Francisco	Davis sewing machine	Diploma.
C. W. Clark	Sacramento	Reversible and self-cleansing water filter	Silver medal.
I. S. Merrill	San Francisco	Asbestos material, pipe and boiler covering	Diploma.
I. S. Merrill	San Francisco	Asbestos material for boiler covering, Cal. manufacture	Diploma.
I. S. Merrill	San Francisco	Pulv. tule & ochre, Cal. man.	Hon. mention.
J. M. Bisaillion	Sacramento	Favorite washing machine	Hon. mention.
L. L. Lewis & Co.	Sacramento	Scroll sawing machine	Hon. mention.
C. H. Lanabe	Sacramento	Two ant-proof safes	Diploma.
Osborn & Alexander	San Francisco	One fire escape	Diploma.
B. N. Bugbey	Folsom	Wible's patent vehicles, axles, and model	Silver medal.
B. N. Bugbey	Folsom	Wible's patent axle cushions	Diploma.
B. N. Bugbey	Folsom	Model of Wible's drawbridge	Hon. mention.
John Simon	Oakland	Burglar-proof doorknob alarm	Diploma.

Miscellaneous Exhibits—Continued.

Exhibitor.	P. O. Address.	Article Exhibited.	Award.
G. N. Milco	Stockton	Buhach insect powder	Diploma.
G. N. Milco	Stockton	Buhach insufflator	Hon. mention.
Geo. Wenzel	San Francisco	Apple and grape crusher and separator	Silver medal.
Geo. Wenzel	San Francisco	Cider press	Hon. mention.
Mrs. L. E. McMahon	Dixon	Three gallons cider vinegar	Diploma.
E. W. Melvin	Davisville	Avalanche rotary flour and meal sifter	Silver medal.
G. W. Garland	Oakland	Garland's imp. sewer-trap	Silver medal.
John Reardon	Ione City	Patent window screen	Diploma.
G. G. Wickson	San Francisco	Eclipse self-regulat'g incubator	Diploma.
G. G. Wickson	San Francisco	Artificial mother	Diploma.
G. G. Wickson	San Francisco	LaMott's artificial mother	Diploma.
Richard Wilkinson	San Francisco	Thompson's apple parer & corer	Diploma.
A. Husing	San Francisco	Samples German green salve	Hon. mention.
James H. Gates	San Francisco	Dr. Thos. Hall's pepsin wine bitters	Silver medal.
Mrs. E. A. Hill	Camanche	Mrs. Hill's insect powder	Silver medal.
F. R. M. Fenn	San Francisco	Impr. meat and vegetable slicer	$2 50.
Hobby & Smith, agents	Sacramento	Guinean's refrigerator	Silver medal.
Hobby & Smith, agents	Sacramento	Guinean's spring filter	Diploma.
M. C. Hawley & Co.	Sacramento	Portable forge	Diploma.
M. C. Hawley & Co.	Sacramento	Log-sawing machine	Diploma.
I. L. Dias	Sacramento	Automatic stock feeder	Silver medal.
Faynton & Derickson	Clayton	Adjust. sidehill header wagon	Diploma.
Geo. O. Bates	Sacramento	Avery transplanter	Hon. mention.
Holman, Stanton & Co.	Sacramento	Extension stepladder	Diploma.
Holman, Stanton & Co.	Sacramento	Fox's lawn rake	Diploma.
James Gayette	Stockton	Sherrill's stubble & weed turner	Diploma.
Lewis Clark	Sacramento	Grain grader and seed cleaner	Diploma.
Baker & Hamilton	Sacramento	Wagon jack	Diploma.
Baker & Hamilton	Sacramento	Store trucks	Diploma.
Baker & Hamilton	Sacramento	Garden barrows	Hon. mention.
J. L. Cook	San Francisco	Dry gold washer	Diploma.
Byron Jackson	San Francisco	Light weight horse forks	Diploma.
Byron Jackson	San Francisco	Tread horse power	Diploma.
King & Rose	Sacramento	Machine for manufacturing sub-irrigating pipe	Diploma.
Holman, Stanton & Co.	Sacramento	Globe horse fork	Hon. mention.
W. E. Livermore	Los Gatos	Brown & Haggard wagon-tongue supporter	Spec. mention.

All premiums in the Miscellaneous Department are simply recommended, the committee not having the power to award premiums directly.

SEVENTH DEPARTMENT.

FINE ARTS.

Exhibitor.	P. O. Address.	Article Exhibited.	No. of Points.	Award.
Julia Ostrom	Sacramento	Eight oil pictures	2	$6 00.
Chas. Prosch	San Francisco	Three oil pictures	4	$12 00.
Mrs. Jos. Strong	San Francisco	Two oil pictures	2	$6 00.
Mrs. T. H. Lewis		Two oil pictures	2	$6 00.
W. R. Freeman		One oil picture	2	$6 00.
Henry Clenewerck	San Francisco	Five oil pictures	6	$18 00.
Fred. Schafer		One oil picture	2	$6 00.
W. A. Coulter		Two oil pictures	12	$36 00.
F. Bouvy		Nine oil pictures	12	$36 00.
A. De Succa		One oil picture	10	$30 00.
S. W. Shaw		One oil picture	6	$18 00.
William Hahn	San Francisco	Eight oil pictures	20	$60 00.
Julian Rix	San Francisco	One oil picture	12	$36 00.
Norton Bush	Sacramento	Twenty-two oil pictures	12	$36 00.
Paul Weber		One oil picture	20	$60 00.
S. M. Brooks	San Francisco	Five oil pictures	8	$24 00.
Joe Strong		Two oil pictures	4	$12 00.
E. Narjot		Eight oil pictures	12	$36 00.
Henry Raschen		Two oil pictures	4	$12 00.
Miss M. Jones		One oil picture	4	$12 00.
William Crosborn		One oil picture	1	$3 00.
W. F. Jackson	Sacramento	Four oil pictures	5	$15 00.
Emil Lund	Sacramento	Three portraits	Void.	
Amanda Austin	Sacramento	Seven oil pictures	1	$3 00.
Flora Weeks		Four oil pictures	1	$3 00.
J. R. Hodson	Sacramento	Twelve oil pictures	5	$15 00.
Flora Carroll		Ten oil pictures	2	$6 00.
F. M. Peebles		One oil picture	5	$15 00.
Ida Elkus	Sacramento	One crayon picture	1	$3 00.
Eugene Elkus	Sacramento	One crayon picture	1	$3 00.
W. J. Straight	Auburn	One oil picture	3	$9 00.
Frederick Flohr	Sacramento	Three pieces statuary	3	$9 00.
Aaron Powers	Sacramento	Three drawings	1	$3 00.
H. A. Dickinson	Dixon	Five landscapes	1	$3 00.
J. B. Nelson	Sacramento	Monogram of the alphabet	1	$3 00.
Miss L. J. Turrell	Sacramento	One crayon and two oil pictures	1	$3 00.
Mrs. E. C. Bingay	Sacramento	Thirty-five pieces porcelain painting	1	$3 00.
Miss Amelia Klepple	Sacramento	Crayon and pencil drawing	1	$3 00.
Mrs. L. H. Wells	Sacramento	Pencil and crayon drawing	1	$3 00.
Miss McCormick	San Francisco	Porcelain painting	1	$3 00.
Sacramento Business College	Sacramento	Penmanship and pen drawing		Rec. sil. medal.
Miss Belle Felter	Sacramento	Porcelain painting	1	$3 00.
Mrs. A. J. Perry	Sacramento	Porcelain painting	1	$3 00.
C. A. Chateau	San Francisco	Porcelain painting	1	$3 00.
Eugenia Excoffier	San Francisco	Porcelain painting	1	$3 00.

MISCELLANEOUS DEPARTMENT.

Exhibitor.	P. O. Address.	Article Exhibited.	Award.
M. S. Hammer	Sacramento	Hammer's Cascara Sagrada Bitters and other preparations	Silver medal.
California Volcanic Mineral Water Co	San Francisco	Natural spring water, known as Fahrenkrug's Eradicator	Diploma.
J. E. Hetherington	San Francisco	One case Tropic Fruit Laxative	Diploma.
Ed. J. Peeler	San Francisco	Foreign and miscellaneous coins.	Silver medal.
James C. Glover	San Francisco	Stamping and stamping patterns	Hon. mention.
Tom. Casselli	San Francisco	Miniature model of Cleopatra's Needle	Hon. mention.
Wheeler & Wilson Manufacturing Co	San Francisco	Largest display sewing machines	Silver medal.
J. A. Studabecker	San José	Tailor square for dress and cloak fitting	Diploma.
William Eberhardt	Sacramento	Display meerschaum	Hon. mention.
William Eberhardt	Sacramento	Display amber work	Hon. mention.
William Pfunder	Portland, Oregon	Pfunder's Blood Purifier, and Safe, Sure, and Speedy Fever and Ague Cure	Diploma.
John Heppart	Nevada County	Bible printed in Ingoldstadt, July, 1602	Hon. mention.
Little & Moen	Petaluma	Patent dividing compass	Hon. mention.

GOLD MEDALS AWARDED IN 1880.

FIRST DEPARTMENT—Live Stock.

To Coleman Younger, San José.

SECOND DEPARTMENT—Machinery, Implements, etc.

To Baker & Hamilton, San Francisco and Sacramento.

THIRD DEPARTMENT—Textile Fabrics and Materials from which they are made.

To Capital Woolen Mills, Sacramento.

FOURTH DEPARTMENT—Mechanical Products.

To Main & Winchester, San Francisco.

FIFTH DEPARTMENT—Agricultural Products.

To General John Bidwell, Chico.

SIXTH DEPARTMENT—Horticultural Products.

To P. H. Murphy, Sacramento.

SEVENTH DEPARTMENT—Fine Arts, etc.

To William Hahn, San Francisco, for oil paintings.

To Sacramento Business College, for fine penmanship, a special gold medal was, on recommendation of regular committee and a Committee of Experts, awarded by the Board.

GENERAL REPORT OF THE STATE FAIR FROM THE SACRAMENTO RECORD-UNION.

TWENTY-SEVENTH ANNUAL FAIR OF THE CALIFORNIA STATE AGRICULTURAL SOCIETY.

FIRST DAY.

[From Daily Record-Union of Tuesday, September 21st.]

The State Fair opened yesterday under very auspicious circumstances. Should the speculations based thereon prove to be well founded, the exposition of eighteen hundred and eighty will surpass that of any previous year in many material respects. The Park opened at seven A. M., and, contrary to the usual custom on a first day, a number of people visited the grounds prior to the afternoon entertainment. It does not appear that there is any very large number of visitors in the city as yet; nevertheless, the patronage at the Park yesterday was financially largely in excess of the first day of last year, and the races were attended by a very large number of people—indeed, a larger number than seen at the Agricultural Society's track on a first day for a number of years.

THE RACES

Were announced to begin at one P. M., but the horses were not called up until about two P. M., and the result was that the sixth race had to be omitted, and the fifth was not finished until after darkness had set in. The programme of races was one of exceeding interest, and was pronounced by all to be one of the best ever presented by the society. The races were numerous, spirited, well conducted, and evidently honestly run. The new system of posting the record of the race on a large black board was unanimously approved, and the satisfaction it gave to all was openly and enthusiastically expressed. The new reporters' stand was warmly approved by the representatives of the press, who were much pleased to be where they could view the entire track during a race without the view being interrupted or they being necessitated to clamber among the upper works of the judges' stand, and hang on to the eaves thereof by their eyelids. With the system of colors for all riders and drivers, and the posting of positions, the colors, and the outcome of heats, the public is enabled to understand and take an interest in racing which it could not heretofore upon the society's race-course, because heretofore only the few could identify the horses during a speed contest. It but remains for the judges hereafter, constantly and inflexibly, to enforce the new rules, the wisdom of which is so evident, and not again permit upon the course the drivers improperly clad.

The first race was running, dash three quarters of a mile, for two year olds; Terry's s. f. Lillie Ashe, color blue, red, and white; Coombs' br. c. by Shannon, color black; Coombs' ch. c. by Shannon, color black; purse $150 added to entrance. The ch. c. had first place and br. c. second. Lillie Ashe was the favorite at $20 to $9 for field, but the field soon became the favorite at $20 to $15 for Ashe. The start was had with Ashe well to the rear, the br. c. leading half way to the score, where all three were about even. On the stretch the ch. c. pushed ahead by half a length and won in 1:19½, Lillie Ashe second. It was a handsome race and nicely contested.

SUMMARY.

AGRICULTURAL PARK COURSE, SACRAMENTO, September 20, 1880.—No. 1—Running—Dash of three-quarters of a mile; for two year olds; $50 entrance, $15 forfeit; $150 added; second horse save entrance.

W. H. Coombs names ch. c. by Shannon, dam by Lodi, black and black 1
D. S. Terry names s. f. Lille Ashe by Jo Daniels, dam Reveille by Woodburn, blue, red, and white 2
W. H. Coombs names br. c. by Shannon, dam by Lodi, black and black 3

Time—1:19½.

The second race was running, mile dash, free to all, 100 pounds weight; Howson's s. f. Snowden, color buff and red; Appleby's Illusion, cherry and blue; Pritchard's Lena Dunbar, red and blue; Baldwin's ch. c. Lexingtor, drab and cross; Baldwin's ch. f. Jennie B., red cap. Purse $150, added to entrance. Positions—Jennie 1, Dunbar 2, Snowden 3, Lexingtor 4, Illusion 5. Baldwin's stable sold for $50, Dunbar $40, Field $35, the pool box being very liberally patronized. The race was just as handsome a contest as any man ever need desire to see in a running race. They got off well together. Snowden led at the turn, Illusion second, Lexingtor, third. Dunbar fell to the rear badly. At the quarter she came up to a fair position, while Snowden and Illusion went side by side to the half-mile post. There Lexingtor took the second place. At the three-quarter post they were well together, with first one then another pushing to the front, and all going for all that was in them, the race exciting the spectators to enthusiasm. Just before the drawgate, Lena, under a lively whipping, came to third place, and for an instant had the second position, but Jennie B. here proved her mettle by passing all in a splendid effort, and passing under the score first, winning first money; Snowden a splendid second, with second money; Dunbar third, and third money; Illusion, fourth; Lexingtor last. Time, 1:42¾, equaling the best time ever made on the track.

SUMMARY.

AGRICULTURAL PARK COURSE, SACRAMENTO, September 20, 1880.—No. 2—Running—Mile dash; free for all; $25 each p. p.; $150 added; each to carry 100 pounds; second horse, $50; third horse saves stake.

L. R. Martin names E. J. Baldwin's ch. f. Jennie B., by imp. Glenelg, dam Reagan, red cap 1
George Howson names s. g. Snowden, by Bloombury, dam by Norfolk, buff and red 2
W. L. Pritchard names c. m. Lenar Dunbar, by Leinster, dam Tibbie Dunbar, red and blue 3
Wm. L. Appleby names b. m. Illusion, by Alarm, dam Mary Hadley, cherry and blue 4
L. R. Martin names E. J. Baldwin's ch. c. Lexingtor, by Lexington, dam Volga, drab and red 5

Time—1:42¾.

The next race was running, dash 1⅛ miles, three-year olds; Goodwin's b. c. Wild Idler, color, dark plum; Pritchard's c. c. Euchre, red and blue; Shafter's b. c. Haddington, red; Judson's ch. c. Tyler, buff and blue. Purse, $250, added to entrance. Euchre had first place, Haddington second, Wild Idler third, Tyler outside. Euchre sold for $70 in the pools, to $12 for Haddington and the field. Pool selling was active in this race. This race proved also a success. It was hotly contested and finely ridden, creating much exciting interest. Haddington led at the start, but at the first turn Euchre came to the bay colt's side, and at the quarter pole took the lead and kept it to the end. Haddington at the quarter fell to the rear. Tyler, near the half, with Wild Idler at his saddle-girth, pushed boldly for a first place, but got to the third position only, while Idler took second rank. Around the turn Euchre was let out and opened a broad band of daylight between her heels and Idler's nose, while the others were strung out also in single file. At the three-quarter pole, however, they were all well massed and came into the stretch at a splendid pace, every rider plying whip and spur, and every animal doing his level best. Tyler pushed for the front and got second place, by hard work, at the score, with Euchre first, Haddington third, and Wild Idler fallen off to the last place. Time, 1:58¾. They took money in the order stated. The quarter pole was reached in 41 seconds, the half in 1:06; and this was a speed hardly looked for in the race.

SUMMARY.

Agricultural Park Course, Sacramento, September 20, 1880. No. 3—Running—Dash of 1⅛ miles. For three year olds; $50 entrance; $15 forfeit; $250 added; second horse, $75; third horse saves entrance. Flood, 10 pounds, Connor, 7 pounds, Euchre, 5 pounds over rule weight.

W. L. Pritchard names c. c. Euchre by Leinster, dam Flush, red and blue	1
L. M. Darling names J. & H. C. Judson's ch. c. Tyler by Wildidle, dam Lizzie Brown, buff and blue	2
J. McM. Shafter names b. c. Haddington by imp. Haddington, dam Prairie Flower, red	3
P. Goodwin names b. c. Wild Idler by Wildidle, dam Eva Coombs, dark plum	4

Time—1:58¾.

The next race was running, dash of 1½ miles, free for all; Winter's ch. c. Connor, color orange and white; Baldwin's b. m. Clara D., color drab and red. Purse $300, added to entrance. Connor in the drawing won first place, and Clara D. second. Clara D. sold as the favorite for $30 to $20, and now and then $60 to $50 for Connor. The horses started even, and went side by side the first quarter of a mile, Connor at the three-quarter leading a half length, but soon after Clara took the lead, and with ease kept Connor at her saddle-girth all the rest of the route, winning by half a length with perfect nonchalance, while Connor showed signs of fatigue. They reached the score in 2:39. The first mile was made in 1:44. It proved a fast race, therefore.

SUMMARY.

Agricultural Park Course, Sacramento, September 20, 1880. No. 4—Running—Dash of 1½ miles, free for all; $25 entrance; $10 forfeit; $300 added; second horse, $75; third horse saves stake.

L. R. Martin names E. J. Baldwin's b. m. Clara D. by imp. Glenelg, dam the Nun, drab and red	1
Theodore Winters names ch. c. Connor by Norfolk, dam Addie C., pink, orange, and white	2

Time—2:39.

The next race was a running stake, three-quarter mile heats, for three-year-old fillies, with the following entries: Coombs' br. f. Tillie

C., color black; Shafter's b. f. Nighthawk, by imported Haddington, red; Chatterton's g. m. Sallie Black, black and tan; Pacheco's b. f. Carmelita, red and black; Judson's b. f. Ella Doane, brown, buff, and blue. Purse, $200, added to entrance. Nighthawk had first place, Doane second, Carmelita third, Black fourth, Tillie outside. The favorite was Black at $60 to $20 for Tillie C., and $15 for the field. There was some difficulty in getting a good start. When the send-off was had, Nighthawk had a position far to the front, Doane, a poor second, and Carmelita third. At the three-quarter pole, however, they all got together, and so came around the turn, running as if for dear life. Sallie was in the rear and the field buyers shouted in glee. They came down the score pretty well together, but Doane and Nighthawk leading. Just before the score the former, by a splendid effort, went to the front a half length and won the heat, Nighthawk second, Tillie C. third, Carmelita fourth, and Black, the favorite, last. Time, 1:16. The best three-quarter record is 1:14. In the pools, which were very lively, Sallie Black now sold for $20 and $25 to $8 and $11 for the field. Tillie C. was once or twice bought as second choice. The next heat was a splendid one and contested "for blood." Nighthawk led, Tillie second for a brief time, but soon yielded to Doane, who kept the second place to the turn, where all ran together, and so to the three-quarter pole. From there it was a magnificent struggle, that roused the spectators to cheers. They came to the score, Black first, Nighthawk second, Tillie third, Doane fourth, but almost neck and neck with Tillie, and Carmelita last. Time—1:17. Sallie Black still sold favorite at $40, Tillie C. $5, and the field $6. The next heat was a perfect astonisher. It was run splendidly. Nighthawk led at first, but Sallie soon went to the front, Tillie trailing behind. On the homestretch they came down, four of them abreast, at a splendid gait. Nighthawk led, and neither whip nor spur could bring a competitor up to her side. Nighthawk won the heat, Tillie C. second, Doane third, Sallie fourth, and Carmelita last. Time—1:19½. This sent Carmelita and Tillie C. to the stable. It was now dusk, and there was some question as to whether the race could be finished before dark. The judges finally resolved to go on with the race. The next heat the horses could scarcely be seen. They came in closely together—Nighthawk first, Sallie second, Doane last, and took moneys in that order. Time—1:22. The pacing race was, of course, postponed, and will come off to-day at twelve o'clock noon, exactly.

SUMMARY.

AGRICULTURAL PARK COURSE, SACRAMENTO, September 20, 1880.—No. 5—(Running Stake)—Three-quarter mile heats for three-year old fillies; $25 entrance; $10 forfeit; $200 added. Second horse, $50; third saves entrance.

J. McM. Shafter names b. f. Nighthawk, by imp. Haddington, dam Napa Queen, red	2	2	1	1
P. M. Chatterton names g. m. Sallie Black, by Waterford, dam Lillie Simpson, black and tan	5	1	4	2
L. M. Darling names J. & H. C. Judson's b. f. Ella Doane, by Wildidle, dam Nettie Brown, buff and blue	1	4	3	3
W. H. Coombs names br. f. Tillie C., by Wildidle, dam by Don Victor, black and black	3	3	2	0
G. Pacheco Novato names b. f. Carmelita, by Lodi, dam by Cheatham, red and black	4	5	5	0

Time, 1:16, 1:17, 1:19½.

AT THE PARK.

Director Daniel Flint, who superintends the Park, has used great exertions to have everything in proper condition, and evidently has succeeded admirably. Every available inch of space has been utilized and has been taken by exhibitors. New stalls are being built, and now, in their incomplete condition, are occupied by stock. There is a much larger number of exhibitors than have attended heretofore. There are horses of all classes, from the fine racer down; cattle of all kinds and sizes, sheep, and poultry. The exhibitors of machinery, farming implements, wagons, etc., are present, but as yet have not succeeded in getting things in a position to exhibit to much advantage. They have been busily engaged so far arranging so as to utilize the power in running their heavy machinery.

It is confidently expected that by this morning everything will be in place. William Sparrow exhibits a two-year old stallion, Ploughboy, as a draft horse. T. J. Hutchinson, a four-year old stallion, Mark Sunham, as a draft horse. G. C. McMullen, a stallion roadster, G. C. Mc. W. O. Jennings, a two-year old stallion, Tempest, and a mare, Kate, and colt, Baby Mine, Yolo Dave and family, stallion Dalrymple, and mares Lady Long and Fanny, as horses of all work. A. Wenamore, Young Planter, a four-year old stallion. A. W. Gabriel, a carriage team, Lucy and Kate, aged respectively four and five years. William Bandeen exhibits a beautiful silver-gray stallion, Selim, as a horse of all work. He is sixteen and a half hands high, and weighs about 1,400 pounds. His stock is a mixture of Tecumseh. H. Halverson exhibits as horse of all work, Lady Grant; Queen and stallion Franklin, as draft horses; Bayswater as a thoroughbred stallion; Belle and colt, Bayswater, Jr., as horses of all work. J. A. Polhemus, Nellie, two-year old; Snap, a yearling stallion; and Flora and colt; Daisy, a suckling colt; Bay Prince, a five-year old stallion, as horses of all work. A. J. Ogden, stallion, Young Tam O'Shanter, as a draft horse. T. Van Vechten, stallion, Combination, as a horse of all work. Fred. Babel, stallion, Fred. Babel, as a horse of all work; Chas. Gilmore, as a roadster. L. G. Butler, Belle Garfield, as a roadster. H. S. Beals, Duchess, a colt, as a horse of all work. W. H. Neeley, Gray Eagle, a stallion, as a horse of all work. M. DeKosta, stallion, Tom. Lawton, as horse of all work. F. C. Neal, Robert Bruce, Jr., as horse of all work; stallion Idol, Jr., as a draft horse. T. Skillman, Tornado, Polly and colt, Gypsy, as horses of all work. H. Webster, Jack Nelson, as horse of all work. Peter Peters, Lizzie, as horse of all work. Geo. L. Culberson, a jack, Kentucky Star. John Ffau, Lizzie May, and stallion Eureka, as horses of all work. T. C. Perkins, Annie and her colt, Victoria, as horses of all work. Cheeney Luce, Lady Lowe, as a roadster. A. Sackrider, stallion, French Spy, and Rockey, as horses of all work.

AT THE PAVILION.

The Pavilion opened in the evening at seven o'clock. The attendance was much larger than on the first evening last year. The spaces for displays were all well filled, and the exhibitors in all the halls, upper and lower, were on hand to give information to the visitors concerning the articles exhibited respectively by them.

During the evening a session of the Board of Directors was held, and the time for making the entries at the Park and Pavilion was extended until twelve o'clock M. to-day. This became necessary, because it was impossible for the entry clerks to complete the entries.

The Superintendent of the Park was instructed to prepare steps to the reporters' stand; also to have notices or placards posted on this stand, stating that it is for the reporters of daily papers of the State only. Complaint was made in regard to the pool selling. It was claimed that the selling was unfairly conducted. A committee was appointed to investigate the same, and report to the Board. The new combination detective ticket adopted by the society as a check on transferring membership tickets works like a charm. At the Park yesterday four tickets were forfeited, and at the Pavilion door last evening quite a number were taken from the holders, who in every instance proved not to be the persons to whom the tickets had been issued. The Board says it is determined to protect its receipts against this practice of transferring tickets if it becomes necessary to publish all the names of those who give away their tickets, as well as those who attempt to enter on them.

Church, Jones & Beebe's band, reinforced by musicians from San Francisco, furnished some very fine music during last evening. The Pavilion closed at ten o'clock and thirty minutes. It opens at eight o'clock A. M. to-day. It is expected that the Presidential party will informally visit the Pavilion this evening.

In the lower hall L. L. Lewis & Co. make a fine exhibit of stoves and ranges, and general kitchen ware, and especially of the product of the Michigan Stove Works, Detroit.

The Capital Woolen Mills exhibits the Crompton improved loom in operation, making fancy cassimere, two different patterns at once.

I. L. Merrill exhibits an elastic sectional wire-conducting covering for steam surfaces, asbestos, wire-bound boiler covering, and steatite roofing.

Thomas Guinean has on display his patent spring filter and his universal refrigerator, both worthy of extended examination.

The Capital Gas Works exhibit a complete model of their works, and a full line of gas stoves.

Hodge, Davis & Co. exhibit quantities of Oregon Kidney Tea, a medicinal preparation by Dr. Henley, much advertised, with claims of curative powers.

The Davis vertical-feed sewing machine is exhibited in variety in the lower hall, and its peculiar working explained by an accommodating and intelligent agent.

C. C. Burr & Co. exhibit baking powders, mustard, spice, etc., in profusion.

George T. Bush exhibits a fine line of copper and brasswork, plumber goods and ware, lamps, gas fittings, bathing tubs, gas and oil stoves, and chandeliers and burners.

Withington & Bagley, of the Capital Soap Works, make a fine display of soaps, among others of the celebrated "King of Soap," an article they lay strong claims for against the world.

In the upper hall M. S. Hammer exhibits in packages the Cascara Sagrada Bitters, Hammer's Glycerole of Tar, etc.

G. W. Chesley & Co. exhibit the celebrated Rock and Rye, for which they are sole agents; also, Chesley's Peach and Honey, and Chesley's Peach Brandy.

Chickering's pianos and the Wilcox & White organs are shown in variety.

Whittier, Fuller & Co. have a display that strikes the eye and arrests the attention at once on entering the hall. It is the finest by all odds ever made in like line in the State, and embraces full samples of white lead, mirrors, plate glass, oil, paints, artist's materials, etc. No mere "notice" can do this exhibit justice.

De Yoe & Riggs exhibit Mason & Hamlin organs, A. B. Chase organs, and Decker Brothers' pianos, all in variety. For the Chase organs the firm makes strong claims, and they would seem to be justified by casual examination sufficiently to demand serious consideration and close inquiry.

Locke & Lavenson exhibit silk draperies, lace curtains, carpets, lambrequins, imported rugs in variety, oil cloths, and generally a rich display of upholstery goods that is very attractive.

B. B. Scott & Son exhibit in variety their flavoring extracts, yeast, Jamaica ginger, and other household goods.

The California Volcanic Mineral Water Company exhibit mineral spring water from Southern California, for which fine medicinal qualities are claimed. This water is known as Fahrenkrug's Eradicator.

George W. Shreve exhibits two fine show-cases, and a rack filled with all kinds of firearms, guns, pistols, rifles, fishing tackle, and sporting goods in general, ammunition, etc.—an attractive display. They show also the celebrated Ditmer powder (white.)

Main & Winchester make a very large display of saddlery goods. Among other things are 500 buggy whips of their own make, and 1,000 riding whips, silver mounted Mexican saddles, and silver and gold mounted harness, varieties of horse boots and stable goods in vast array. It is the best arranged display ever made by this firm at a State Fair, and the best in that line of goods ever seen here.

The Antisell piano and standard organ is shown by T. M. Antisell & Co. in variety. The display is large and attractive.

R. A. Fisk exhibits a variety of telegraph and electrical instruments and telegraph supplies; also specimens of silver plating.

W. K. Vanderslice & Co. exhibit one large case of solid silverware of their own make, and quartz jewelry. In this case are shown articles in silver in the varied stages of manufacture.

S. J. Nathan make a large exhibit of trunks, men's and children's clothing, hats and caps, gents' furnishing goods and jewelry, hosiery and underwear, etc., most of it from their own factory in New York.

W. F. Peterson makes a large exhibit of fine confectionery, fancy confections, rare art work in sugar, some choice jellies, and pastry with ornamental confection work thereon, and a great variety of beautiful work in these lines, besides full exhibits of the staple and plainer confectionery of commerce. All the exhibit is of his own manufacture.

One of the most noticeable displays in the upper hall is that made by Weinstock & Lubin, of the Mechanics' Store, Sacramento. In the main hall these merchants have a complete department from their extensive manufactory, there being a very long table where a small army of sewing machine operatives are seated at work, and behind them a forewoman, cutter, and assistant. The machines are operated by a compact steam engine standing on the end of the sewing counter, and supplied by a steam pipe from the lower story. A catalogue of what the firm has made in this department cannot be given here; suffice it to say that nearly every kind of men's, children's, and women's wearing apparel is manufactured with neatness and strength, and is turned out with great expedition. This introduction of a complete manufactory of this kind into a fair is a novel and interesting feature. In the small hall, immediately back of the exhibit in the main hall, and connecting with it by doors, is the millinery, drygoods, hat, and variety department. Here are shown many rich and choice silks and satins, latest styles of hats, French millinery, jewelry, optical goods, shoes, boys' clothing, infants' suits, elegant opera cloaks, fine dress goods, etc. The lighting of these two departments is very superior, and both are flooded with light from scores of burners, many having reflectors and casting the light downward. The fine upright showcases are thirty-four feet long by ten feet high. As a whole, the exhibit is one to be seen frequently and examined critically, and will well repay for the examination.

James G. Davis makes a very fine display of upholstered drawing-room furniture, with the richest of material, and executed in the choicest style known to the trade. The workmen who accomplished the execution of this work are evidently among the first. Mr. Davis also displays a handsome office or library table, and rich library case.

John Quin shows his patent burglar-proof door-knob alarm, and explains its working.

J. A. Studabecker exhibits a new system of dress and cloak fitting.

The J. M. Brunswick & Balke Company have a handsome display of the Standard, Monarch, Nonpareil, Novelty, and Eclipse billiard and pool tables.

Mrs. Katzenstein exhibits four large cases of millinery goods, one of flowers, one of feathers, one of ladies' hats, and one of trimmings. The whole is an attractive exhibition.

Scott & Muir make an unusually fine display of gas hangings, chandeliers, gas standards, drop lights, shades, etc. The display is rich and attractive, and very neatly arranged.

The Misses Brothers exhibit four cases of fine millinery. Two of these contain fine bonnets and hats; one contains a rich display of flowers, and one an elaborate arrangement of choice feathers. The cases constitute one of the centers of attraction for ladies when in the Pavilion.

A large and unique display is made of Clark's "O. N. T." spool cotton.

James Parsons exhibits a case of fine shoes, slippers, etc., for ladies and misses, and boots of superior finish and workmanship for youths and men.

In the line of electrical belts, Holmes & West show a patent belt, made by them, for which superior curative claims are made.

The automatic sewing machine is exhibited in operation in the upper hall.

C. W. Rapp & Co., grocers, in a large space in the main hall, exhibit pyramids of Boisseler's gilt edge yeast powder and "premium" tea.

RECEIPTS.

The receipts at the Park yesterday were two thousand four hundred and forty-five dollars and seventy-five cents. On the first day last year, there were one thousand six hundred and fifty-seven dollars and fifty cents, which shows a gain in favor of this year of seven hundred and eighty-eight dollars and twenty-five cents. At the Pavilion, the receipts were two thousand six hundred and fifty-four dollars; last year they were one thousand seven hundred and forty-three dollars and fifty cents, showing a gain in favor of this year of nine hundred and ten dollars and fifty cents. The total receipts of yesterday are greater than those of Monday of the last year's Fair by one thousand six hundred and ninety-eight dollars and seventy-five cents, showing that the extra efforts made by the Board of Directors are bearing rich fruit.

SECOND DAY.

[From Daily Record-Union of Wednesday, September 22d.]

The second day of the State Fair was a successful one for the Agricultural Society. The patronage exceeded that of the like day last year. The spirit of the people was of the kindliest toward the association. The stock parade developed the fact that the finest gathering of stock is secured yet known to expositions on this coast. The races were well attended, satisfactorily run, and so conducted as to be greatly enjoyed by spectators. The Pavilion has filled up handsomely with exhibits, and the appearance of the interior justifies general commendation and praise. The arrival of the President of the United States, in response to the invitation of the Agricultural Society, has gratified the popular desire to meet the Chief Magistrate face to face, and have him and his party witness a State Exposition of California's produce and industry. And so, in all regards, the State Fair opens auspiciously, and promises to have a successful and profitable termination.

AT THE PAVILION.

The Pavilion opened yesterday at seven o'clock A. M., and during the day the attendance was quite good. In the evening the attendance was somewhat better than on the previous evening.

At eight o'clock the President of the Association and Board of Directors proceeded in a body from the office of the Secretary to the stand in the northern end of the building, where President H. M. Larue delivered the annual address, which was listened to with marked attention.

The music announced to be rendered by the band was very effective, the solo upon the xylophone by Alex. Kidd, of San Francisco, eliciting a very strong encore from the visitors. The solo rendered by J. L. Mundwyler, of San Francisco, upon the saxophone, was also well received.

The exhibits are now all in place, and the opinion is general that the Fair, in all respects, is a great improvement on previous years.

Clarence Nelson makes a very handsome display of fine saddlery, buggy and horse robes, and livery goods. The saddlery is confined this year by Mr. Nelson to the Mexican saddle and its outfit. The bridles are richly inlaid with silver.

J. C. Glover, Sacramento, exhibits very handsome and artistic specimens of stamping and stampers' materials. This exhibit is the most extensive and complete ever made here in this line. Glover makes his own stamps, and has over ten thousand, and does every variety of work.

Sherman, Hyde & Co. exhibit the Sherman & Hyde upright piano, made in California. Also the Weber piano and the Estey organ.

John Breuner has a display of library and office furniture, and richly upholstered parlor furniture, fancy bed lounges, etc.

The Capital Woolen Mills make a fine display of home industry in the shape of the Mills' woolens, cloths, cassimeres, yarn, fine blankets, etc. This is one of the most suggestive exhibits in the whole Fair, and the goods exhibited should be examined by all. The Mills have a Crompton loom in operation in the lower hall.

F. A. Ebel, Sacramento, exhibits a fine collection of foliage plants, new and rare, and conservatory plants, and a display of bouquets and flowers.

Cooke & Son, Sacramento, exhibit in large variety their make of fruit boxes, fruit and berry packing cases, patent fruit shipping boxes, etc.

The Misses Brothers, in addition to the four cases of millinery already noticed, have in the small hall a splendid long wall case filled with the rarest and richest of millinery, velvets, satins, ribbons, and rich millinery goods generally.

The Pacific Spring Mattress Company have a fine exhibit of the products of their factory.

B. F. Farrar, San Francisco, exhibits spring beds and mattresses of his make in variety.

B. N. Bugbey exhibits Wible's model for a drawbridge; also, the same inventor's patent axle, with rubber cushion. Both inventions are worthy examination.

Hobby & Smith, Sacramento, exhibit Guinean's universal refrigerator and his spring filter; also, terra cotta and Rockingham ware, the vitrified iron-stone drain pipe, etc.

George Spiker shows tobacco grown near Sacramento, and the plant also, in pots.

George H. Fuller shows the patent folding school desk.

J. M. Brisaillon exhibits "The Favorite" washing machine.

Aitken & Fish exhibit work in marble and granite mantels, monumental work, etc.

The Capital Woolen Mills exhibit in the lower hall a bale of California cotton, grown in Merced County, on the lands of the late Mr. Strong. Mr. Tryon pronounces the cotton first-class.

Myer & Duncan show the Knuckle Roller washing machine, the corn, pumpkin, and seed planter and apple parer, and the parlor toy gun.

Mr. Bascom exhibits his Triumph tomato.

J. R. Jewell, Petaluma, fine cheese.

A. J. Rider, specimens of cheese.

Mrs. L. Bahle, thirty pounds of butter.

General Bidwell, Chico, exhibits a large number of varieties of flour, wheat, barley, oats, corn, Egyptian corn. It is one of the largest and most valuable exhibits in the entire exposition.

G. W. Harlow, a large sack of Iowa Bluestein wheat; also, the Egyptian corn or wheat.

D. McGregor & Co., show fine melons.

F. Bahle, varieties of vegetables.

E. B. Hunt, fine pumpkins.

Garland's improved sewer-gas trap, in operation, is shown in the lower hall. It should be examined carefully.

Osborn & Alexander show scroll saws, bicycles, fancy and household hardware, etc.

Hobby & Harper, for the Sacramento Pottery, exhibit a lot of stone and earthenware from that factory.

Wm. Eberhardt, case of shotguns, ivory work in the turner's line, rifles, meerschaum pipes, amber mouth-pieces, etc.

Mrs. E. C. Bingay, handsome specimens of porcelain painting, by herself and her pupils. Plaque and tile work and fine designs in flowers on cups and saucers, etc., a very attractive art exhibition.

The Tropic Fruit Laxative is exhibited in a handsome glass case.

The Pulvermacher Galvanic Company exhibit their belts and electrical apparatus for cure of diseases.

In the line of fancy work, embroidery, needlework, etc., there are exhibits as follows:

Mrs. J. N. Porter, lace curtain, crochet work, dressing gown, embroidered bedspread and pillow shams, outline embroidery, sofa cover, table cover, chair stripes in crewel work, and ottoman cover.

Mrs. W. A. Houghton, wall panel silk and crewel embroidery, toilet set, bureau scarf, chenille tidy, crochet shawl, embroidered table cover and lambrequins.

Miss Belle Felter, chair stripes chenille work, sofa curtain chenille work, outline embroidery, and complete toilet set of thirteen pieces chenille work.

Miss N. Montford, braid work, silk embroidery, linen embroidery, embroidered handkerchiefs, and embroidered dress.

Miss Nellie K. Rogers, point lace work, hand-made point lace, moss work, embroidered raised work, and sofa cushion.

Miss Anna Benedict, child's afghan.

Mrs. R. O. Cravens, crochet shawl.

Mrs. M. M. Sickler, point lace hand-made collar and cuff.

Miss Addie Wells, Macrame lace, Java canvas toilet set, worsted butterfly.

Miss A. B. Lawson, lawn dresses, hand-stitched napkins, aprons.

Miss Katie Meister, pincushion, toilet set, motto, pillow shams.

Mrs. R. L. Hillman, rack towel (embroidered), lamp-stand mat in worsted crochet, knit tidies, canvas pincushions, canvas tidies, sofa pillow in silk.

Miss Belle Felter, Kensington embroidery (table covers) lamp-stand mat, silk embroidery, silk embroidered skirt, pen wiper ditto, skirts, ditto, Kensington embroidered tidy.

Mrs. James R. Lawrie, child's afghan, embroidered hankerchiefs, toilet set—five pieces.

Phœbe C. Brown, lace pillow shams, tidy on linen canvas, patchwork footstool.

Mrs. W. F. Hicks, embroidered chenille toilet cushions, crochet collar, sofa cushion.

Mary E. Aiken, girl's lace dress, perforated work, lace pillow shams, tidy, toilet set.

Mrs. M. G. Hoyle, fish-scale jewelry.

John Cordam, fancy box.

Miss G. Miller, five knit pieces.

Mrs. M. E. Williams, lace-work pillow shams.

Mrs. T. P. Lowell, knit stool-cover.

Lucy Purlon, toilet set.

Nellie Gilson, pillow shams.

Mrs. A. C. Gardner, sofa cushion.

A. Winans, a splasher.

Maud Anthony, woven mat.

Horatio Stoll, card-board work.

Work by pupils of Mrs. Byrnes' kindergarten school.

A large amount of work by Masters and Misses Ada Dierssen, Maud Anthony, Ida and Maud Lenoir, Joe Kerrur, Fred. Hillard, Frank Gerber, and others.

Mrs. Kitty Walther, chair set, crochet chair tidy, toilet set, pillow shams, set of table mats, chair stripes, five cameo paintings, crochet table cover, sofa cushion.

J. D. Clevenger, lamp-stand mat.

Mrs. R. J. Quick, knit stockings.

Mrs. J. M. Bisaillon, embroidered baby's cloak.

Mrs. N. D. Goodell, knit foot rug, crewel work, Persian rug, and a crewel tidy.

Mamie B. Cross, point lace—many pieces.

Mrs. M. A. Morehead, Spanish stitch hand-made hankerchiefs, embroidered tablespread.

Miss Alice Parker, feather work.

Miss H. H. Smith, cone work.

Mrs. H. H. Smith (seventy years), hanging basket, wall pockets, and cone work.

Mrs Wrightman, toilet set and ornamental needlework.

Miss A. J. Perry exhibits thirty-eight pieces of porcelain painting; a very good display.

Miss M. E. McCormick, twenty-five pieces of porcelain painting; tasteful and attractive.

H. C. Megerle, of the California Curiosity Shop, exhibits cases of stuffed birds, dried grasses, pampas plumes, fine feathers, bird wings, etc.

S. Lipman & Co., Sacramento merchants, make a fine display of fans, gloves, silks, 'kerchiefs, collars, old laces, rare laces, the Foster kid gloves, satins, lace scarfs, collars, etc.; an exhibit rich and attractive.

Miss Belle Felter, in a large upright glass case, displays a parlor stool and an ottoman cover in chenille work; a richly embroidered parlor chair, fancy boxes, fourteen specimens of porcelain painting, fine Kensington embroidery, etc.

The Sacramento Business College exhibits samples of business penmanship.

The Wheeler & Wilson sewing machines are exhibited by E. H. Emery, the Sacramento agent, with operatives at the machines.

Continuing the general review of articles in the lower halls there are found:

Dale & Co.'s (Sacramento) exhibit of fine basket and wicker ware—a display attractive, varied, and enterprising.

Billingsley & Co. have an immense display of wooden ware, tubs, brooms, pails, baskets, etc., all made by them, or in Sacramento factories they represent. The display is thoroughly interesting to the thoughtful, as indicating manufacturing possibilities here.

J. F. Cooper exhibits musical instruments, fancy goods, baby carriages, perfumery, toilet articles, and a great variety of showcase goods.

Fenn's meat shaver and vegetable slicer is exhibited in operation.

Heywood Bros. & Co. exhibit their make of rattan furniture.

Gilbert & Moore show fine samples of novel library desks and tables; also cots, school furniture, wire-woven mattresses, globes, and school supplies, etc.

George L. Wenzel exhibits his apple and grape crusher, and cider and wine press.

Tubbs & Co. exhibit great columns of cordage of all kinds from their works at San Francisco. The entry is by Huntington, Hopkins & Co., Sacramento.

The receipts yesterday at the Park were one thousand six hundred and eleven dollars; at the Pavilion, one thousand one hundred and sixty-five dollars and fifty cents. Last year on Tuesday the receipts at the Park were one thousand three hundred and thirty-one dollars; at the Pavilion, seven hundred and sixty-two dollars—showing a gain at both places in favor of the present year amounting in the total to six hundred and eighty-three dollars and fifty cents.

AT THE PARK.

Yesterday the Park opened for visitors at seven o'clock A. M. There was a large attendance as early as nine o'clock A. M., who came to witness the grand parade of stock, which had been announced to take place at ten o'clock. Promptly at the time announced the stock appeared upon the track, and passed in review twice around the course. When they were all out, it took the entire length of the track to accommodate them.

At the conclusion of the stock parade the wing-shooting tournament commenced, under the auspices of the Forester Gun Club, and lasted throughout the day.

Among the exhibits we find that R. A. Noel has nine head of Jersey cattle; Samuel Blair exhibits a Jersey bull entitled Bill Dad the Scribe; P. Stanton, nine head of Jersey cattle; T. Wait, three head; Robert Beck, twenty-two head; M. Wick, seventeen head of Durham cattle; E. Comstock, four mares and four colts, as horses of all work; also a stallion and a Durham bull; also seven graded cattle; P. H. Murphy, a carriage team, Bell and Fannie, a horse of all work, a graded cow, and four Durham cattle; John Bidwell, two Durham bulls; J. Askew, one Jersey heifer and one bull; George Bement, nine head of Ayrshire cattle; Henry Pierce, represented by Luther C. Powers, exhibits one Jersey bull and eight cows, and two Guernsey cows; Charles Clark, a herd of four Durham bulls and six cows.

In the place set apart for buggies, wagons, etc., we find as exhibitors J. F. Hill, A. Meister, Baker & Hamilton, and Studebaker Brothers, of Sacramento, each having a fine display.

THE RACES.

The races yesterday were well attended and proved successes. The stands were populated largely, and the people enjoyed the races as they never did before, because they were able to understand them. The whole history of each preface to each heat, of the outcome of each heat, and the result of the races, were plainly posted on the great blackboard, which, by the way, should have been made the size originally planned—twelve by twelve feet—with one foot letters and room to post two races, when concluded, as was twice done yesterday; and though the people from the extreme ends of the stand could not read the lines on the board, they were quite content, because they could at least send or go and ascertain the facts. Every driver came on the track in a neat uniform of distinct colors, and if any spectator was so dull he could not count one, two, three, from the inner fence along the line of horses, and thus identify each horse, he could, as a last resort, look up and see what color the driver wore, and then glance at the board to see what horse was driven by a man wearing that color. In short, the new system is admirable, and is the subject of universal comment and praise, and now, if ever the judges permit it to be infringed in the slightest degree to gratify the whim of any driver, they will forfeit all claim to respect for their office; but it is too good a system to ever be abandoned on the Agricultural Society course. Rather it will be improved upon, and made more nearly perfect—for which there is still room. For its introduction here the lovers of field sports are indebted to the State Agricultural Society directory; for the details of its arrangement at the Park they are indebted to the firmness and good taste and executive ability of Daniel Flint, Superintendent of the grounds. The "press gang" in the reporters' stand were yesterday placed under obligations to Chief Marshal Mike Bryte for courtesies extended.

The first was a pacing race, free for all, purse $600, with these horses: s. g. Nimrod, dun g. Johnny Weigle (unknown), blk. s. Washington, by Bucephalus, dam, a Leviathan mare, s. g. Hi Tracy (unknown), b. f. Dido, by Scott's Hiatoga, dam Columbia—Tracy at the pole, then Weigle, Nimrod, Dido, Washington. In the pools Nimrod sold for $40, Washington for $12, Weigle for $7, field, $7 to $10. They all got a good start except Dido, who was sent off in a run. Weigle soon led and kept it to the end. Tracy pushing for the first, broke at the quarter and fell off at the half. Washington was second. Dido was far to the rear, but could not regain all the bad start burdened her with. They came in, Weigle first, Washington second, Nimrod third, Tracy fourth, Dido distanced. Time—2:24.

In the next heat a fine send-off was had. Washington led to near the half, when Nimrod, for a time, neck to neck with the leader, went to the front and kept that place to the outcome. Nimrod first, Washington second, Weigle third, Tracy fourth. Time—2:21¾.

In the next heat Nimrod held first place at start and throughout. On the upper turn Washington took from Weigle the second place, but he regained it at the three-quarter pole. It was a handsome trot. Nimrod won in 2:22½, Weigle second, Washington third, and Tracy barely saving his distance

In the next heat, for the first half mile there was splendid trotting. Nimrod and Washington led side by side to the eighth, when the former got a half length ahead, and kept the place despite the effort to displace him. On the approach of the half, Washington broke and went to a bad fourth. They were so strung out now that it really seemed as if Nimrod would distance the lot, but he was held and allowed to jog in winner of heat and race in 2:22½, Weigle second, Tracy third, Washington last.

SUMMARY.

Agricultural Park Course, Sacramento, September 21, 1880.—No. 6—Pacing—Free for all; purse, $600; first horse two thirds; second, two thirds remainder; third, the balance.

William H. Cade names s. g. Nimrod, white and black	3	1	1	1
George A. Vignolo names dun g. Johnny Weigle, black and red	1	3	2	2
S. Sperry names blk. s. Washington, by Bucephalus, dam, Leviathan mare, blue	2	2	3	4
E. H. Robinson names s. g. Hi Tracy, orange and pink	4	4	4	3
I. N. Killip names b. f. Dido, by Scott's Hiatoga, dam, Columbia, black	dis.			

Time—2:24, 2:21¾, 2:22½, 2:22½.

The next race in order was in part sent off between heats of the preceding one. It was trotting, stake for two-year old class; $25 to accompany nomination, and is to be forfeit; $75 to be paid the first day of Fair. If two colts start, $250 to be added; first colt three quarters, second colt one quarter. No added money to be given for a walk-over, except the best time of the State be beaten, in which case $100 added money will be paid the colt beating said time. The colt making the walk-over shall receive all the stakes and forfeits. The horses were: L. Stanford's b. c. Fred. Crocker, by Electioneer, dam by Malenche, by St. Clair—black and black; br. f. Sweetheart, by Sultan, dam Minnehaha—red and black. Sweetheart had the pole and sold favorite, $160 to $80. Sweetheart led all the way round, but broke at the tap of the bell, and made four other breaks before the quarter pole was reached, and gained each time. The filly kept the colt a length behind to the three-quarter pole, and then opened a gap of seventy-five yards, held up to let the colt save distance, and won the heat by three lengths in 2:31½. The half mile was made in 1:14.

In the next heat Crocker led at the start, and kept it with his rival one and two lengths behind until the first upper turn was reached, when Sweetheart collared him and went by his side to the head of the oval, when she broke again. At the three-quarter pole Sweetheart passed Crocker and came in easily three lengths ahead, winning heat and race. Time, 2:32¼.

SUMMARY.

Agricultural Park Course, Sacramento, September 21, 1880.—Trotting—Stake for two-year old class; $25 to accompany nomination, and is to be forfeit; $75 to be paid the first day of Fair. If two colts start $250 to be added; first colt three quarters, second colt one quarter. No added money to be given for a walk-over, except the best time of the State be beaten, in which case $100 added money will be paid the colt beating said time.

L. J. Rose names br. f. Sweetheart, by Sultan, dam Minnehaha	1	1
H. R. Covey names L. Stanford's b. c. Fred. Crocker, by Electioneer, dam by Malenche by St. Clair	2	2

Time—2:31½, 2:32¼.

It should be here stated for the benefit of the general reader that the two heats above made are the best two-year old heats ever trotted, and that the best of these heats is in time within half a second of the best time ever made by two-year olds. Sweetheart was purchased from L. J. Rose of Los Angeles, by E. S. Stokes, her present owner, to be presented, it is understood, to John Mackay of Nevada.

The next race was trotting, 2:40 class; purse, $1,000; first horse two thirds, second two thirds of remainder, third the remainder; Deitz mare barred. The horses were r. g. Tommy Dodd, by Alexander, dam a Clay mare, color, pink and orange; Stanford's blk. g. Clay, by Fred. Low, dam Maid of Clay, blue; b. m. San Mateo Belle, by Speculation, dam Young Lady Vernon, black and white; s. m. Susie, by George M. Patchen, Jr., dam Santa Clara, purple and orange; b. g. Ewing, black and blue; b. m. Lady Ellen, by Carr's Membrino, dam by Owen Dale, gray and black; ch. m. Venus, by Venture, dam unknown, red and black. Venus had first place, Susie second, Ellen third, Dodd fourth, Clay fifth, Belle sixth, Ewing outside.

Clay sold favorite, $50 to $30 for Dodd, field $18 to $20. This race presented a track full of fine animals, and as they were scored on the stretch, with the drivers all clad in neat jackets and caps of positive colors, the array was more than attractive. There were eight false starts, and on the ninth score they all got off, with Ewing to the rear. Ellen led nicely, with Clay at her wheel, and Dodd third. From the one-quarter to the three-quarter post it was a fine struggle between Ellen and Clay. On the last upper turn Dodd put in an appearance in the front rank, Clay broke and fell off badly. Dodd steadily gained, and (with Venus next to his wheel) threw his competitors to the rear. They came in, Dodd first, Venus second, Clay third, Belle fourth, Ellen fifth, Susie and Ewing distanced. Time—2:24.

The pools stood: Dodd $75, Clay $30, and the field $15. Dodd at the commencement of the next heat, gave evidence of lameness, probably from the result of his lameness in the races at Petaluma. A fair send-off was had, Clay leading freely, and keeping it up till the three-quarter post was reached. Venus went second, but between the quarter and half broke and lost ground. Ellen went third, and at the half-mile post pressed for the front, and at the three-quarter post had collared the leader, but soon after broke and lost, leaving Clay to come in first in 2:28, Venus second, Dodd third, Ellen fourth, and Belle fifth. The spirit with which Dodd, on the backstretch, warmed to his work and got down to a fine trot, despite his lameness, was something worth the seeing. The field now sold in the pools for $80, and Dodd and Clay $30 each.

Dodd came up for the next heat very lame, and after once scoring was permitted to withdraw, much to the discomfiture of his backers. Clay led in this heat, Venus second, and Belle third, but the latter broke at the quarter-post and lost badly. Venus broke at the half, and ran and broke twice or thrice again, and repeated her runs. Ellen broke early in the start, but made up her losses, and beyond the half-mile pole passed Venus and took second place and kept up a pace that soon gave her the lead, which she kept to the score, coming in in 2:28, Venus second, but placed third for running, and the second place was given to Clay, who came in third. Belle was last.

In the next heat Clay came up nursing, because of an attack of "thumps," which in white man's English means a palpitation of the heart from over-exertion. This left the field in high feather. Ellen led, Belle second, but Venus took second place at the quarter, and Belle breaking, lost badly. Near the half Ellen broke, came almost to a dead halt, and Venus took first place. Belle meanwhile trailed far to the rear, and on the homestretch ran like a deer. They came in to the drawgate Venus first, Ellen second, when suddenly Venus broke, and Ellen, just on the verge of defeat, shot ahead, and they went to almost the score neck and neck, when Venus broke, and Ellen passed under the score by a neck ahead. Time, 2:31.

In the next heat Ellen experienced no difficulty in keeping her rivals well to the rear, and she won easily, under a pull, Venus second, Belle distanced. Time, 2:33. This gave the race to Lady Ellen and enriched the short-end pool buyers.

SUMMARY.

Agricultural Park Course, Sacramento, September 21, 1880.—Trotting—2:40 class; purse, $1,000; first horse two thirds, second two thirds of remainder, third the remainder; Deitz mare barred.

D. J. Green names b. m. Lady Ellen by Carr's Membrino, dam by Owen Dale	5	4	1	1	1
Ben. Timmins names ch. m. Venus by Venture, dam unknown	2	2	3	2	2
W. Z. Price names b. m. San Mateo Belle by Speculation, dam Young Lady Vernon	4	5	4	3	dis
H. R. Covey names L. Stanford's blk. g. Clay by Fred. Low, dam Maid of Clay	3	1	2	dr	
R. B. Milroy names r. g. Tommy Dodd by Alexander, dam a Clay mare	1	3	dr		
Robt. Beck names s. m. Susie by Geo. M. Patchen, Jr., dam Santa Clara	dis				
R. J. Merkley names b. g. Ewing	dis				

Time—2:24, 2:28, 2:31, 2:33.

The next race, which was in part sandwiched with the preceding one, was for the trotting colt stake, foals of 1877; $100 entrance; $25 forfeit; $400 added; 60 per cent. to first horse, 30 per cent. to second, 10 per cent. to third. The horses were: b. f. Hattie Johnson, by Echo, color red and black; r. f. Phaciola, by Silverthread, color green and black; b. f. Prima Donna, by Mohawk Chief; b. f. Bell Echo, by Echo, color blue. The pools stood: Bell Echo, $50; Phaciola, $12; Hattie, $8. They had position at the start in the order above given for pools. Bell Echo led, Phaciola and Hattie broke together on the first turn. At the quarter Hattie went second. Near the half-mile post Phaciola passed and went to second place, but on the turn fell off to third, and broke on the last turn with still greater loss. However, the space was soon recovered, and the horses came in, Echo first, and only jogging to save distance to the others, so far to the rear were they on the turns. They made the best of the favor, and Phaciola came in second, Hattie third. Time—2:48½.

In the next heat Bell Echo led, and at the quarter-pole was 100 yards in advance, with Phaciola second. Near the half-mile post Hattie took second place, and began to close the wide gap between her and the leader. They came in, Bell Echo first, and only jogging, Hattie second. Time 2:48½.

In the next heat Bell Echo led with Hattie Johnson a very good second, which was maintained to the half-mile post. At times Hattie was right at the leader's wheels, and on the turn into the homestretch made a vigorous push for the first place, but Echo came in, without much exertion, winner of the race in 2:49¾—Hattie second and Phaciola last.

SUMMARY.

Agricultural Park Course, Sacramento, September 21, 1880.—Trotting Colt Stake—Foals 1877; $100 entrance; $25 forfeit; $400 added; 60 per cent. to first horse, 30 per cent. to second, 10 per cent to third.

Charles A. Durfee names J. C. Newton's b. f. Bell Echo, by Echo, dam by Belmont	1	1	1
L. H. Titus names b. f. Hattie Johnson, by Echo, dam unknown	3	2	2
L. J. Rose names r. f. Phaciola, by Silverthread, dam Minnehaha	2	3	3

Time—2:48½, 2:48½, 2:49¾.

THIRD DAY.

[From the Daily Record-Union of Thursday, September 23d.]

Yesterday was a triumphal day for the Directory of the State Agricultural Society, in that it was marked by the largest attendance at Park and Pavilion known for years, and was honored by the presence of President Hayes and party. The receipts were in excess of the great "sham battle day" of last year. It is estimated that at the Park, at two o'clock P. M. yesterday, there were assembled not less than sixteen thousand people. This great congregation in gallery, stand, lobby, quarter-stretch, and paddock, was a sight worth a long trip to see.

AT THE PAVILION.

Last evening the Pavilion opened at seven o'clock. At an early hour the halls were all well filled. At nine o'clock the Presidential party arrived, and at that time the upper hall was so densely filled that it seemed impossible to have packed another person in. During the evening the music rendered, as heretofore announced, was frequently encored, and pieces had to be repeated in several instances. At half-past ten o'clock, when the Pavilion closed, the crowd was still very large, and only departed when notified by the ringing of the bell that the hour for closing had arrived.

Display of grain grown in California, exhibited by the University of California.

Johnston Brandy and Wine Company exhibit specimens of grape brandy and California wines.

The Brighton Distillery Company shows samples of wine.

Mrs. R. Davenport, rag rugs.

Chris. Weisel exhibits a fine lot of calfskins, kips, and products of his tannery in Sacramento.

Ed. J. Peeler, a case of rare, old, and foreign coins.

Etta Seydel, bobbinet bed set.

Mrs. E. Excoffier, handsome examples of porcelain painting.

Mrs. H. H. Pierson, case of skeleton leaves, lambrequin with beads, and fine needlework and embroidery.

Eugenia Excoffier, tatting and crochet work, and hairwork.

Mrs. F. Thoss, crochet table-cover, stockings, tidies, etc., with specimens of hand-knitting. This lady is sixty-five years of age. She resides at Nevada City. It is a fine exhibit of practical needlework and handwork, of the old style, but admirable and good.

E. K. Krause, scroll sawing, and collection of California grasses.

J. F. Cooper, case of fine goods, worsteds, embroidery silk, crewels, etc.

Mrs. M. A. Morehead, moss picture—very original and pretty.

Miss Alice Parker, basket of wax flowers.

A case of fine silks, laces, fans, and rich dress goods, from the People's Store, Sacramento, conducted by Hamburger & Co.

Mrs. L. L. Landerken, "Descent from the Cross," in wax; stitchwork; "The Ascension," in wax; "Joseph and Mary," in wax.

A large case from Dale & Co., Sacramento, of silk goods, twists, embroidery silk, etc.; a very handsome and rich exhibit. Also, from Dale & Co., a long case filled with worsteds, embroidery cloths and patterns, crewels, yarns, worsted, worked rugs and mats, guitars, accordeons, flutes, violins, sheet music printed in California, etc.

Hammock, made by Leslie Trobridge.

Mrs. George T. Bascom, hearth rug.

Quilts and bedspreads, by Mrs. F. C. Neal, Mrs. Rosa Waters, Mrs. B. F. Tade, Mrs Sarah Rhorer, Mrs. T. Lyman, Mrs. J. Swootman, Mrs. T. L. Acock, Mrs. A. B. Hunt, Mrs. L. N. Billings, Mrs. M. A. Hunter, Mrs. C. Hohn, Mrs. E. Doolittle, and others.

Rugs, by Mrs. A. L. Hoyle, Mrs. R. Davenport, and others.

Knit afghans, by Mrs. C. H. Cummings and Mrs. O. C. Howe.

Kindleberger's sham holder is exhibited.

Silk-made handwork, piano cover, by Mrs. William Eberhardt; a very handsome exhibit.

Truman S. Clark & Co. show folding parlor bed, folding chair, gas pipe iron bedsteads with woven wire mattresses.

J. H. Archer shows a patent bed for invalids.

H. Nyland, of San Joaquin County, exhibits a box of cranberry plants in full bearing. It is believed to be the first in California.

Cooke & Son exhibit great numbers of the codling moth, phylloxera, scale insect, an apple worm, and other destructive pests that afflict farmer and orchardist, and with which Cooke & Son have made investigation as to habits, growth, etc., and have discovered a preparation that defeats these enemies to industry. The phylloxera exhibited are few in number, and dead, care being taken to avoid any spread of the pest in California. This exhibit is under the auspices of the society. Professor Comstock has added to the exhibit varied specimens of the scale insect.

The Perfect Water Company exhibit their filter, which is small, attaches to the house hydrant, and is an instant complete filter. This company is composed of Sacramento residents.

Mrs. L. E. McMahan exhibits pickles and fruit in jars in variety; also California olives and California olive oil, preserves, etc.

T. M. Lash exhibits his adjustable fruit gatherer, a notably fine invention.

Mrs. S. E. Hart, jams and jellies, peaches in brandy.

Mrs. H. Cronkite, a large display of preserves, California wine, pickled and spiced fruits and vegetables, etc.; also jellies, jams, canned fruit, etc. Her exhibit occupies thirty feet of space.

Miss Belle Henley exhibits fine jellies and preserved fruits.

Mrs. A. Abel displays blackberry jelly and other jellies.

Mrs. W. Bassett, varieties of fine jellies.

Preserved pears by Mrs. H. G. Fonseca.

Miss Mattie Hunt, variety of fine jellies and jam.

T. Duffy, samples of garden rustic work, hanging baskets, seats, stand for flowers, aquariums, etc.

F. Luderman exhibits a great quantity of flowering plants and shrubs.

Thomas O'Brien displays cut flowers, potted and other plants of all descriptions, fine foliage plants, etc.

F. Kunz exhibits a fine collection of foliage plants, rare flowers, choice shrubs, ferns, cut flowers, etc.

J. Rutter, Florin, exhibits Muscatel raisins and fine varieties of grapes.

P. H. Murphy, Brighton, has a fine display of grapes, raised on Sacramento upland without irrigation.

R. S. Lockett has two benches with rich samples of Brighton-grown grapes in variety.

Thomas Hardie, of Placerville, exhibits grapes in variety and of fine quality; also Muscatel raisins, cured by him.

Gaspard Konig, Napa Valley, exhibits the "White Nice" grape.

I. S. Bamber, Placerville, exhibits a great variety of fine grapes, grown in El Dorado County; also one hundred and thirty-eight varieties of peaches, pears, apples, plums, figs, seedling fruits, nectarines, prunes, and dried figs.

P. H. Murphy, Brighton, exhibits a quantity of fine fruit, apples, pears, peaches, etc.

A. T. Hatch, Cordelia, exhibits varieties of California-grown almonds; also some fine pears.

A. Mouton exhibits a quantity of fine apples.

Wm. H. Jessup, Hayward's, exhibits a large quantity of superior fruit—apples and pears chiefly.

Williamson & Co., from the Capital Nursery, exhibit tropical California fruits, such as lemons, oranges, limes, etc., also small fruits, such as plums, etc., in fine variety; also the Spanish chestnut; also seedlings of fruit and great quantities of pears, peaches, and apples. The exhibit is made up by Williamson of fruits gathered from the lands of different customers, and is, therefore, a representative exhibit of Central California.

The California fruit-dryer is shown by J. H. Burke.

Flint & Leeman, O. O. Lovdall, A. Mouton, Daniel Flint, and J. E. Camp exhibit great quantities of hops.

AT THE PARK.

The Park opened at the usual hour yesterday morning. The wing-shooting tournament was the attraction of the day up to the time of the arrival of the President. After the reception of the President the races commenced, and were continued until quite late. This morning there will be a grand parade of all the stock on exhibition. President Hayes and party will be present and witness the parade. At the conclusion of the parade Sherman's trained horses will be exhibited in front of the grand stand.

The receipts yesterday were as follows: At the Park, three thousand one hundred and forty-four dollars and forty-five cents; at the Pavilion, one thousand two hundred and thirty-four dollars. On Wednesday of the Fair last year the receipts were one thousand five hundred and seventy-six dollars at the Park and six hundred and fifty dollars at the Pavilion; and on the best day last year (the day of the sham battle), the receipts were three thousand eight hundred and twenty-seven dollars and twenty-five cents at the Park, and five hundred and thirty-eight dollars and fifty cents at the Pavilion.

THE RACES.

The Park was a scene of great animation and brilliancy yesterday as the bell sounded for the first race. The grand and special stands, enriched and glowing with the variegated colors of the costumes of the ladies and children, made a brilliant picture, while in the inclosure there were a dense mass of equipages, with horsemen following the steeds or scudding across the sward to catch them on the homestretch. The programme was not a very lengthy one, but comprised two races, in which were entered some first-class trotters, on the merits of which the sporting community were greatly at variance, and as such a state of affairs leads to speculation, the pooling was very heavy during the day.

The first race was for the 2:25 class, for a purse of $1,000, in which there were nine entries, of which only four made their appearance at the start, namely: Elaine, Gibraltar, Reliance, and Echora. Elaine, on the strength of her Eastern reputation, and having made a heat in her five-year-old form in 2:24¼, then the fastest time on record, was made a favorite at $120 against $30 for Echora, $15 for Gibraltar, and $12 for the two others, and the pools would probably have been sold with Elaine left out, had not the very knowing ones had an inkling that she might be worked through a strained tendon on her off hind leg, that is said to show feverish symptoms after a hard heat or two. Of a real race there was really no appearance, Marvin holding his pretty mare well in hand, and acting on Talleyrand's maxim, "Especially no zeal," he let her trot with her splendid gait, and was never headed throughout the race. In the first heat Reliance was only a length behind her at the half-mile, but Gibraltar, who had made a poor break at the first turn, came up very fast in the home stretch and secured second honors, Echora being last. The time, 2:21¼, was received with a great deal of enthusiasm. The betting was now even, except with those lunatics who take losing odds in the chance of the favorite being overtaken with a fit or with the thumps, as was the case with Clay on Tuesday, and Elaine was again in a jog, Gibraltar being a poor second and Echora third in 2:22½, and then in the final heat she sailed to the front, and this time it was Echora that secured second honors, Gibraltar occupying the third position. Time, 2:24. This victory of the Palo Alto stable elicited much enthusiasm, and its owner, ex-Governor Stanford, when he was presented with the gold cup by the Association, was received with rounds of applause.

SUMMARY.

AGRICULTURAL PARK COURSE, SACRAMENTO, September 22, 1880.—Trotting—2:25 class. Purse, $1,200. First horse, two thirds; second, two thirds remainder; third, the balance.

H. R. Covey names L. Stanford's b. m. Elaine, by Messenger; dam, Green Mountain Maid, by Henry Clay	1	1	1
M. Salisbury names b. s. Gibraltar, by Echo; dam, unknown	2	2	3
L. H. Titus names br. m. Echora, by Echo; dam, the Young mare	4	3	2
James M. Learned names b. h. Reliance, by Alexander; dam, Maud, by Mambrino Rattler	3	4	4

Time—2:21¼, 2:22½, 2:24.

Then Occident—that celebrity of California—was speeded to a buggy, and hearing the cheers that greeted him, the old war-horse shook his mane and showed by his splendid gait that, although well laden with years, he had lost none of that courage that had gained him well-earned laurels on the same track.

The next race was for three-year-olds and under, in which, of the thirteen entries, there were Annie Laurie, Button, Honesty, Belle Echo, Len Rose, and Glencora, of which the first two were equal favorites in the pools, selling for sixty dollars, and the remainder in the field at forty dollars. Now it was well known that Annie had beaten Button last week in Oakland, but there were many who backed the latter on his really staunch qualities against the well-known fleetness of the mare, and as it turned out, their faith was rewarded by a handsome running. The gong was sounded to a bad start, Annie Laurie being in a full gallop, and it was a full hundred yards before she could be brought to her gait, Button in the meantime taking the lead and holding it to the finish, with Annie second through injudicious driving, and the others pulling up. Time, 2:34½. In the second heat, Button was a great favorite over all the others combined. The driver of Button, this time, was caught napping, and although he had an advantage of nearly eighty yards through a bad break made by Annie at the back stretch, she beat him out in splendid style in 2:30, by a neck, with Belle Echo a good third. All the betting was now reversed, and Annie was looked on as a certain winner at two to one against all the others, no one thinking how terribly the previous exertion must have told upon her, and she getting badly off her feet. Button had all the honors to himself in the fast time of 2:29, with Belle Echo a poor second. Now it was all Button's, but the mare would not relinquish the race without a gallant struggle, and making again two bad breaks and a skip, in which she was not so speedily held in hand as the rules require, she came up with a rush and beat Button out by a length, and in consequence was declared a dead heat in 2:30½, the time of the second horse, Belle Echo being a good third. The decision was received, not with murmurs of discontent only, but with slighting remarks as to the animus of the judges, a movement that was at once instantly squelched by the President, Mr. Larue, calling on the gentlemen in front of the stand to point out the offenders, so that they should be at once ejected from the track. This firmness was in excellent form, and deserves all credit, for no gentlemen can possibly be found to act as judges if they are to be taunted by every man who happens to have lost on the race. The President in the last heat called up Donathan, the driver of Annie Laurie, who was smarting under his quasi defeat in the previous heat, and told him that he would distance Annie Laurie if she would indulge in such running as in the previous heat, and on a disrespectful rejoinder, Donathan was fined ten dollars, and then, darkness fast approaching, the horses were dispatched to a bad start, the outside horse being lengths behind. Annie Laurie went all to pieces with a succession of breaks, and Button won as he liked in 2:35, with Len Rose second, and Annie last—beaten, but not disgraced.

SUMMARY.

Agricultural Park, Sacramento, September 22, 1880.—Trotting—Three years old or under class; $25 to accompany nomination, and is to be forfeit; $75 to be paid the first day of the Fair. If two colts start, $250 to be added; first colt, three quarters; second colt, one quarter. If three start, $300 to be added; first colt, two thirds; second, two thirds of remainder; third colt, the balance. No added money to be given for a walk-over, except the best time of the State be beaten, in which case $100 added money will be paid the colt beating said time. The colt making the walk-over shall receive all the stakes and forfeits.

S. Crandall names b. c. Alex. Button, by Alexander, dam Lady Button	1	2	1	0	1
J. C. Newton names b. f. Belle Echo by Echo, dam by Belmont	4	3	2	3	2
C. A. Durfee names gr. s. Len Rose by A. W. Richmond, dam Barbara	5	5	3	5	3
John Wade names s. s. Honesty by Priam, dam by Chieftain	3	4	5	4	4
William Smith names b. m. Annie Laurie by Echo, dam by Tenbroeck	2	1	4	0	5
H. R. Covey names L. Stanford's blk. f. Glencora by Mohawk Chief, dam Lady Gilbert	6	dis			

Time—2:34½, 2:30, 2:29, 2:30¾, 2:35.

A PRESENTATION TO GOVERNOR STANFORD.

Between the second and third heats of the first trotting race yesterday, the State Board of Agriculture assembled in the lunch room attached to the Directors' stand. Occident had been placed upon the track in a light buggy, and was being speeded up and down the stretch for the purpose of exhibiting his movements. The attention of the crowd was directed to the movements of the horse, when the Board, headed by the President, emerged from the stand bearing a large casket. They approached Governor Stanford, who was sitting near the railing of the Directors' stand, when President Larue addressed him by name. Governor Stanford rose, being wholly unconscious of the object of the movement. President Larue then recited the gift to the society of the Occident plate, worth two thousand dollars. He also stated that an old undischarged obligation from the Society to Governor Stanford, in the sum of one thousand eight hundred dollars, remained unpaid. He recited further, that Governor Stanford, in his generosity, had agreed that the Occident plate and the balance of one thousand eight hundred dollars due him should constitute an endowment, the interest of which should be used in the purchase of a cup, to be called the Occident Cup, to be given as a trophy to California-bred colts; and the State Board of Agriculture, desiring to testify to their high appreciation of the generosity exhibited by Governor Stanford, and believing that he was entitled to the first of the series of Occident cups which would be offered and won by trained horses, the Board had thought it fitting that such cup should be presented to him. In the name of the Board, therefore, President Larue presented Governor Stanford with a splendid gold cup. Upon one side was inscribed, "Governor Stanford, from the State Board of Agriculture, State Fair, September, 1880. Occident Cup." On the other side a splendid etching of the horse Occident in motion, copied from a photograph taken for Governor Stanford by the new electro-photographic process. Governor Stanford, very much surprised, responded, declaring that his surprise and gratification could find no fitting expression in language. He had always felt a great interest in the success of the State Agricultural Society, regarding it as one of the great instruments of public education. He referred to the history of the horse, dwelling upon his origin in Asia Minor and the climatic conditions best adapted to the development of a high strain of horses. He declared that, in his opinion, California would yet equal any part of the world in breeding horses for the road, the turf, and the farm. He thanked the State Board of Agriculture heartily and feelingly for their appreciation of what they were pleased to term the favor he had conferred on the society, and he hoped that the Occident Cup would find many competitors in the annual exhibitions.

FOURTH DAY.

[From the Record-Union of Friday, September 24th.]

The fourth day of the annual exposition of the State Agricultural Society, like the three preceding ones, was a success. Socially, financially, and beneficially, the Fair has been a complete success thus far. The exhibits are many, good, and full; the stock superior in number and quality to that of all previous exhibits; the Pavilion more attractive than ever before; the races without material blemish, and their conduct admirable; the direction of the Board of Agriculture pleasing to the people; the patronage liberal, and in all other things there has been a gratifying and creditable result, and the outlook is that such will be the final verdict.

AT THE PAVILION.

The Pavilion was opened at seven o'clock A. M. yesterday. During the day the attendance was exceedingly good. In the evening the attendance was very large. The Honorable Horace Davis delivered the annual address, upon the subject of an "Agricultural Bureau for the Pacific Coast." During the evening the Board of Directors of the society held a meeting. A communication was received from the San Francisco Bulletin, presenting to the society a large picture handsomely framed, of the great American trotter, St. Julien. The picture was received by the Board, and thanks returned to the donors.

The silver and gold medals of the Agricultural Society, to be awarded at this Fair, were yesterday received from the manufacturers, and will to-day be on exhibition in the case, in the small upper hall, where the prizes for the ladies' tournament are shown.

The receipts for yesterday were as follows: at the Park, two thousand four hundred and thirty-one dollars and fifty cents; at the Pavilion, eight hundred and eight dollars and fifty cents. On Thursday of last year's Fair the receipts at the Park were one thousand seven hundred and seventy-one dollars; at the Pavilion, eight hundred and forty-five dollars.

Continuing the review of exhibits, we notice that the California metallic window screens are shown by R. Reardon, San Francisco.

The Royal Baking Powder Company exhibit a great quantity of their baking powder.

Howard Bassett, scroll-saw cutting—very handsome.

Miss C. R. Brothers, point lace handkerchief, embroidered pincushion and sofa cushion—very handsome.

Mrs. J. R. Lawrie, Santa Clara, exhibits samples of fine sun-dried fruit—a very superior exhibit.

Cap's pure apple cider and vinegar is shown, with presses and machines in operation.

G. T. Bascom shows twenty-five varieties of choice garden seeds; also the Bascom tomatoes and a quantity of beets. squashes, etc.

A. L. Tryon, display of sugar beets and squashes.

P. Brusi, full fine display of beets, squashes, pumpkins, garden products, corn, potatoes, etc., in great variety. This exhibit is a very large and attractive one.

Felix Gabrielle exhibits potatoes, onions, beets, cabbages, and a full line of garden vegetable growth. It is an extensive and pleasing display.

A. B. Gilbert shows green corn, shelled early corn, squashes, white corn, etc.

W. C. Hull exhibits some fine watermelons.

Some great pumpkins and squashes are shown, with no exhibitor's name.

D. Hunt, fine large pumpkins.

E. L. Hyde, some fine potatoes.

There is in the lower main hall a fine exhibit of dried fruit, also rare varieties of grapes, and some choice green fruit, but there is never a name, card, or label to indicate to whom the credit belongs. It is surmised that they are shown by General Bidwell of Chico.

A. J. Sliner shows bags of choice wheat, three thousand five hundred and eighty-four pounds yield from twenty acres of the kind known as "Pride of Battle;" also two thousand eight hundred and ninety-nine pounds from twenty acres of the brand known as "Patent Office."

H. Cronkite exhibits in bags, samples of white Tuscany wheat, white Chile wheat, and Waterloo oats.

G. W. Colby exhibits one sack Australian wheat, one of club wheat, one of proper wheat, and one of Sonoma wheat.

There is shown by the Wheatland Grange boxes of debris, soil before and after debris deposit, etc. One sample of virgin soil prior to debris deposit, is labeled as producing eighty-one bushels of barley per acre. The same is shown after deposit, when it produced but five bushels of barley, and that even after several years of good cultivation. The Grange shows also a great block of the sediment as packed by deposit after having been carried for miles down the rivers. It is the regular slickens. There is shown also a box of the "white sand" deposit as found over thirteen feet deep over fine bottom land of richest character. All these soils are taken from S. D. Woods' ranch, one mile from Wheatland.

One of the most interesting exhibits is that made by the College of Agriculture, University of California, showing great varieties of grain, in stalk and seed, grown without irrigation. Also samples of grains from other sections than California.

Mrs. Hill's California insect powder is shown in quantity.

The Oregon blood purifier and liver regulator is exhibited by William Pfunder & Co., Portland.

Mrs. Quick, a well known lady, in a quiet corner of the lower hall, has a neat exhibit, fresh each day, of button-hole bouquets.

Mrs. E. F. Aiken exhibits a large quantity of excellent sun-dried fruit in variety.

Mr. E. S. Hart has a good display of sun-dried fruit, varied and plentiful.

A. I. Rider exhibits some fine cheese.

F. Ludeman exhibits in his floral department some real curiosities, such as growing plants of tea, coffee, camphor, the pineapple, and the Kaura tea plant of Australia.

Williamson & Co. show growing orange and lemon trees, and some remarkable examples of rapid fruit tree growth in California, all of which is very interesting.

J. F. Cooper has in the small upper hall a case of musical instruments, fancy goods, worsted, embroidery silk, sheet music, toilet articles, etc.

AT THE PARK.

Yesterday the Park opened at seven o'clock A. M. The grand parade of stock took place at nine o'clock. President R. B. Hayes and party being present, were invited into and occupied the judges' stand. Immediately after the parade of stock was over, Sherman's trained horses were exhibited in front of the grand stand. There was a very large concourse of people present at an early hour, and they remained the entire day. The shooting tournament, under the auspices of the Forester Gun Club, was concluded.

During the parade of stock an accident occurred which nearly cost a colored boy, who is employed in Judge Terry's stables, his life. He was on the inner track exercising his horse. When he was passing the judges' stand there were some hacks standing in the way. The horse made a sudden stop and threw the boy over his head. He received a very hard fall and was unconscious for some time. He was taken to his stable and soon revived.

Among the exhibits we find that J. L. Cook exhibits a dry gold-washer; Larkins & Co. and B. Grave exhibit wagons, buggies, etc.; B. Jackson, agricultural implements; H. D. Nash & Co., improved Nash & Cutt's grain separator; Holman, Stanton & Co., a large display of agricultural implements; A. W. Lockhart, self-feeder and elevator; John Klees & Co., improved Nash & Cutt's grain separator—four sizes; Baker & Hamilton, a large lot of California manufactured implements, machinery, etc.; B. Peeler, Forester well-pump; R. M. Beebe, improved pumping apparatus; Rusby & Merey, improved feed mill, patent corrugated rollers; L. M. Lush, force and suction pump, also a fruit gatherer; M. R. Rose, windmills, pump, and steam engines; D. E. Goldsmith, gem turbine windwill; A. D. Miller, one Harris windmill; G. Saccone, one windmill; E. A. Scott & Co., iron header wagon; Faynton & Derrickson, adjustable side-hill header wagon; J. C. Sheprer, one Sherrill gang plow; M. C. Hawley & Co., a large lot of farming machinery; William Gutenberger, a farm feed-mill and clod breaker; J. F. Davis & Son, a lot of buggies; H. Brightman, a farm gate; Batchelor, Van Gelder & Co., spring-tooth harrow and cultivator; Charles Kechner, improved harrow.

In the department set aside for poultry we find exhibits as follows: T. D. Morris, a large lot of chickens, consisting of silver Polish, black Cochins, black Polish, black Hamburg, Dominics, dark Brahmas, black Spanish, white Cochins, Plymouth Rock, brown Leghorns, light Brahmas, brown red games, white Polish, Malay game, partridge Cochins, black breasted red game Bantams, white Sultan, silver-spangled Hamburgs, golden-spangled Hamburgs, Houdans; also wild and bronze turkeys and ducks as follows: Cayuga, Pekin, white Dorkins, and Aylisburgs; geese as follows: Toulouse, white China, gray China, and one pair of white Guineas; F. S. George, two black Spanish chickens; J. N. Fuller, four pair of Pekin ducks, three trio Plymouth Rock chickens; T. Wait, one pair white Leghorns, one pair brown Leghorns; M. DeCosta, three Neck Beauties; E. S. Hart, three Rouen ducks, three black Spanish chickens; N. Neeley, white Leghorns and golden peasant chickens; Mrs. L. E. McMahan, two trio of bronze turkeys, eight trio of brown Leghorns, six trio of

Plymouth Rocks; John Rider, two pair of Toulouse geese; Eddie Earl, eleven Seabright bantams; E. Gallup, trio of white Dorkins and a pair of Pekin ducks; C. Rapp, trio golden Seabright bantams.

In the department set apart for swine we find exhibited as follows: E. Gallup, twenty-four head of Poland China; Hugh Cave, nine head of Berkshires; E. Comstock, twenty-one head of Berkshires; John Rider, twenty-five head of Berkshires; T. D. Valentine, two head of Berkshires; M. D. Boruck, two head of Berkshires; John Kennedy, three head of Berkshires.

In the department set apart for sheep we find exhibitors as follows: Mrs. R. Blacow, thirty-nine head of French merinos; J. H. Strowbridge, twenty-four head of Spanish merinos; E. W. Wolsey, nineteen head of Spanish merinos; C. Younger, eight head of Cotswolds; J. S. Harris, one hundred head of Angora goats; B. Cavanaugh, fifteen head of Angora goats.

In the stock department, in addition to those already mentioned, we find these exhibits: E. R. Lyle, one jack, Golconda; G. W. Carey, one jack, two-year old; D. Flint, three head Durham cattle; E. L. Aiken, two head Jersey bull calves; E. F. Aiken, two head Jersey cows; R. J. Merkley, eight head Durham cattle; Robert Ashburner, ten head Durham cattle, and two graded cows; Coleman Younger, twenty-six head of short-horned cattle; Jesse D. Carr, of Monterey County, thirteen head Durham cattle; L. U. Shippee, seven head of horses, as horses of all work; Charles Murphy, four head of thoroughbred horses; D. Gannon, one mare as a roadster; L. Whitmore, one stallion as a roadster; Roy Coil, one stallion as a roadster.

THE RACES.

There was a very large audience in attendance at the races yesterday, probably not less than 8,000 people, possibly as many as 9,000. The sport was good and the programme satisfactory. It is a matter of remark by all who are familiar with the course, that the quarter-stretch has never before been so promptly cleared when ordered, nor has such good order been kept on the track before, as under the management of Chief Marshal Bryte and his assistants. It was specially noticeable yesterday that the people have found out that what the Marshal says he means.

The first race was trotting, stake for 2:22 class; $25 to accompany nomination; $75 to be paid the first day of the Fair. If two start, $300 added; two thirds to first horse and one third to second. M. Salisbury names br. g. Bateman, by H. Clay, dam American Star; James B. McDonald names b. s. Brigadier, by Happy Medium, dam Lady Turner, by Frank Pierce.

Brigadier was the favorite in the pools, by $100 to $12. Bateman won the pole and led by half a length to the upper turn, when Brigadier went ahead. Bateman broke near the drawgate and ran up close to the score. Brigadier won easily by half a length in 2:22¾. In the second heat they went beautifully and even to the quarter-post, when Bateman led by a neck, but at the half Brigadier led by a half length. Around the head of the oval they went neck and neck, trotting in a manner to arouse the enthusiasm of the spectators. They came to the score Brigadier a half length winner. Time—2:23¾. It was perfectly evident that Brigadier could have won by a much greater distance had his driver been so disposed, and that Bateman kept him company only by suffrance of Brigadier's engineer. The third heat was a repetition of the second and was won by Brigadier in 2:26.

SUMMARY.

Agricultural Park Course, Sacramento, September 23, 1880.—Trotting—Stake for 2:22 class; $25 to accompany nomination; $75 to be paid the first day of the Fair. If two start, $300 added; two thirds to first horse, one third to second.

James B. McDonald names b. s. Brigadier, by Happy Medium, dam Lady Turner by Frank Pierce	1	1	1
M. Salisbury names br. g. Bateman, by H. Clay, dam, American Star	2	2	2

Time—2:22¾, 2:23¾, 2:26.

The next race was for running stake, mile dash, for two-year-olds; $25 entrance; $10 forfeit; $250 added. Second horse, $50; third to save stake. Winners at Oakland and three-quarter dash at this Fair to carry five pounds extra. W. L. Pritchard names ch. c. Frank Rhoads, by Leinster, dam Adi A.; colors, red and blue. Theodore Winters names Fred. Collier, by Joe Hooker; color, pink. Wm. L. Appleby names s. f. Laura Winston, by Norfolk, dam Golden Gate; colors, pink and blue. Theodore Winters names b. c. Duke of Norfolk, by Norfolk, dam Marion by Malcolm; colors, pink and orange. L. M. Darling names J. & H. C. Judson's b. g. Belshaw, by Wildidle, dam Susie W.; colors, buff and blue. George Howson names b. c. Douglas, by Wildidle, dam by Norfolk; colors, buff and red. W. L. Pritchard names ch. c. Jim Brown, by Foster, dam Flush; colors, white and blue. The positions were given as named above. The Duke of Norfolk carried the five pounds extra, and that though he did not win in the three-quarter dash at this Fair, and why he was weighted was not explained. In the pools Pritchard's stable was favorite at $60; Winters' stable, $30; Appleby's, $10; field, $6. This race was a splendid one, the horses all going off well together, and running splendidly. Frank Rhoads led to the quarter, with Collier second, and all the rest right at their heels. So they went to the half-mile post, when Collier collared Rhoads, and they went around the turn neck and neck, thundering into the homestretch at a splendid pace, with all the others close upon their track; but Collier forged steadily to the front, and won in 1:45½, Rhoads second, Norfolk third, Brown fourth, Belshaw fifth, Douglas sixth, and Winston seventh. Collier is the first Joe Hooker colt that ever started. The race was one full of interest, was hotly contested, and the beauty of the animals was the subject of universal compliment.

SUMMARY.

Agricultural Park Course, Sacramento, September 23d, 1880.—Running stake—Mile dash, for two-year-olds; $25 entrance; $10 forfeit; $250 added. Second horse $50, third to save stake. Winners at Oakland and three-quarter dash at this Fair to carry five pounds extra.

Theodore Winters names Fred. Collier, by Joe Hooker	1
W. L. Pritchard names b. c. Frank Rhoads, by Leinster; dam Adi A.	2
Theodore Winters names b. c. Duke of Norfolk, by Norfolk; dam Marion, by Malcolm	3
W. L. Pritchard names ch. c. Jim Brown, by Foster; dam Flush	4
L. M. Darling names J. & H. C. Judson's b. g. Belshaw, by Wildidle; dam Susie W.	5
George Howson names b. c. Douglas, by Wildidle; dam by Norfolk	6
Wm. L. Appleby names s. f. Laura Winston, by Norfolk; dam Golden Gate	7

Time—1:45½.

The next race was a running race, free handicap; one and five-eighths mile dash; $200 added; second horse, $50. Weights announced September first; declarations to be made on Saturday before the race.

Thomas Jones names b. h. imported Australian, by Kelpie, dam Imagination by imported Dover, 5 years, 100 pounds. Wm. Appleby names b. m. Illusion, by Alarm, dam M. Hadley, 5 years, 97 pounds. L. R. Martin names E. J. Baldwin's ch. c. Lexingtor, by Lexington, dam Volga, 4 years old, 100 pounds. George Howson names s. g. Snowden, by Bloomsbury, dam by Norfolk, aged, 105 pounds. They had positions in the order given above. Snowden sold favorite in the pools, Glen second. The race was a neat one and well contested. Lexingtor led at the start and up to half, with Glen second, until the last upper turn was reached, when Snowden went second, but soon fell off to third place. Lexingtor still led at the score, with Glen second and Snowden third. The others were close behind. On the backstretch Glen pushed to the side of the leader, and on the entrance to the homestretch was neck and neck with him, and an instant after took the front place and kept it. It was a pretty push down to the score, and the horses ran like startled deer. They came to the score—Glen first in 2:52¾, Snowden second, Lexingtor third, Illusion fourth, Australian fifth.

SUMMARY.

AGRICULTURAL PARK COURSE, SACRAMENTO, September 23, 1880.—Running—Free handicap. One and five eighths mile dash; $200 added; second horse $50. Weights announced September first; declaration to be made on Saturday before the race.

Theodore Winters names s. m. Mattie Glen, by imp. Glen Athol, dam Mattie Gross, 5 years old.. 1
George Howson names s. g. Snowden, by Bloomsbury, dam by Norfolk.................... 2
L. R. Martin names E. J. Baldwin's ch. c. Lexingtor, by Lexington, dam Volga............ 3
Wm. Appleby names b. m. Illusion, by Alarm, dam Mary Hadley........................ 4
Thomas Jones names b. h. Imported Australian, by Kelpie, dam Imagination by imp. Dover.. 5

Time—2:52¾.

The last race was a running stake, 2⅛ mile dash; $100 entrance; $25 forfeit; $500 added; $150 to second horse; $75 to third. 1. L. R. Martin names E. J. Baldwin's ch. f. Jennie B. by imported Glenelg, dam Regan. 2. Theodore Winters names ch. c. Connor by Norfolk, dam Addie C. The horses had positions as above numbered. In the pools Jennie B. brought $500 to $130, that being the highest pool sold, and the others showing like degrees of comparison, as $230 to $100, $100 to $15. Jennie B. led all the way around. Connor traveled forty yards behind for the first mile, but it was evident that the mare could have kept him further at the rear. On the last mile, as they left the score, Connor went after his competitor in a splendid rush of speed and very nearly overhauled her, while the vast audience rose up and cheered the effort lustily. But he could not collar the mare, who came in winner by a neck in 3:51½. Connor ran the last mile in 1:44¼, the first mile was made in 1:46. The race was a splendid one and created great enthusiasm.

SUMMARY.

AGRICULTURAL PARK COURSE, SACRAMENTO, September 23, 1880.—Running Stake—Two and one eighth mile dash; $100 entrance; $25 forfeit; $500 added; $150 to second horse; $75 to third.

L. R. Martin names E. J. Baldwin's ch. f. Jennie B. by imported Glenelg, dam Regan...... 1
Theodore Winters names ch. c. Connor by Norfolk, dam Addie C........................... 2

Time—3:52½.

FIFTH DAY.

[From Daily Record-Union of Saturday, September 25th.]

The fifth day of the State Fair was another red-letter day for the Directory, and proved a satisfaction to the people. Nothing occurred to mar the success of the day's programme. The fact that the day's receipts fell below those of the like day last year arises from the fact that the same day last year was "the sham battle" day, when an immense assemblage was present. But it must be borne in mind that on Thursday of this week the receipts exceeded those of even sham battle day. Thus to date the society is financially over three thousand dollars ahead of the Fair of eighteen hundred and seventy-nine to like date.

AT THE PAVILION.

Last evening the attendance at the Pavilion was as large as on the previous evening. The music rendered by the band was unusually fine. The solo upon the xylophone, by Alex. Kidd, was fine, and warmly encored by the audience. The receipts of the day were as follows: Park, one thousand seven hundred and eighty-six dollars; Pavilion, six hundred and twenty-two dollars and seventy-five cents. Last year on Friday of the Fair the receipts were as follows: Park, three thousand eight hundred and twenty-two dollars and twenty-five cents; Pavilion, five hundred and thirty-eight dollars—showing a falling off on the receipts of the same day last year of one thousand nine hundred and fifty-two dollars; but Friday of last year's Fair was the best day of the week, while it has not been so this year. The total receipts of the Fair this year up to this time, are seventeen thousand nine hundred and one dollars and ninety-five cents. During the same days of last year the receipts were fourteen thousand six hundred and ninety-six dollars and seventy-five cents—showing a gain in favor of the present year of three thousand two hundred and five dollars and twenty cents.

Continuing our review of the Pavilion, we find a few articles not heretofore noticed.

William Gutenberger shows a handsome and large piece of quartz from the Quartz Hill mine.

Miss Mary E. McCord exhibits a school of kindergarten instruction in the lower hall, and explains the system in a very interesting manner.

D. H. Larrabee shows a patent spring bed and several ant-proof kitchen safes.

R. Dale exhibits two pieces of sheet music that are curiosities. One is the first sheet printed in California—eighteen hundred and forty-nine—and the price then was two dollars. The second is the first piece printed in Sacramento, and is dated eighteen hundred and fifty-eight, Dale, publisher.

Mrs. G. Marks, in the small upper hall, exhibits a specimen of picture embroidery in worsted, a full-rigged ship at sea.

THE ART GALLERY.

The art gallery at the Pavilion has, all this week, been thronged by spectators. And it is but justice to record that the great mass of the people have manifested by their free criticisms and pronounced judgments an artistic sense and taste which speaks volumes for popular art culture, and the progress which is being made by true art among the people. It is plainly evident that the artists of this State and the art collection institutes have entered upon the right path in this matter of more frequent and free public exhibits of art works. The result has been an elevation of the public taste, cultivation of the natural love for the beautiful, and an inquiry into the realm of art by thousands who, but for the awakening induced by such exhibitions as that now in the art gallery, would never have risen to a consideration of art matters at all. In eighteen hundred and seventy-nine, the first real art exhibition under the direction of experienced art directors, took place in connection with the annual expositions of the State Agricultural Society. The success of that exhibition, the popular appreciation with which it met, induced its repetition this year. The gallery is temporary, and includes the west balcony of the Pavilion, which is covered in and admirably arranged for the purposes intended. The exhibition is under the direction of J. R. Martin, Assistant Secretary of San Francisco Art Association and School of Design. The pictures were nearly all hung under his direction, and he has, by authority of the State Board of Agriculture, general charge of the exhibition. The exhibits were secured by the society appropriating the sum of six hundred dollars to be distributed among the exhibitors according to a plan which abolishes the "first and second premium" idea, which, when applied to art work, is simply farcical in a State Fair, and instead of that plan, provides for such an equitable distribution of the money, according to merit of exhibit, as shall compensate the artists, at least in part, for making the exhibits, and thus eliminates the objectionable feature that heretofore was prominent, to wit: that one artist was superior to another, or his work better or worse than another, because of the amount of money awarded as a "premium," according to the judgment of any committee that a directory might hastily pick up. Most of the pictures were solicited from artists or owners by Mr. Martin, and are from private studios and the Art Association rooms at San Francisco.

The works in the oil painting department are: The Chamois Hunter, by Charles Prosch, of San Francisco. Two mediæval figures, by Mrs. Joe Strong, of San Francisco. Two pieces, fruit and flowers, by Mrs. J. H. Lewis, Sacramento. The Perils of Prospecting, by W. R. Freeman, of Sacramento. Portrait of Washington, by Charles Prosch, of San Francisco. Still Life; fruit and grapes; View in Gulf of Spezio; Landscape; Marine View; and Still Life, oysters, fruit, etc.—all by Henry Clenewerck, of San Francisco. Autumn scene—White Mountains, by Fred. Schafer, of San Francisco. Harbor of Elsinore by Moonlight, and the Arrival of General Grant at San Francisco, by W. A. Coulter. Tartouf from Moliere; portraits (a large number), by F. Bouvy. Solid Comfort (a convivial piece); Maraquita Going to Her First Bull-fight; Gil Blas' Departure for Salamanca—all by F. Bouvy, of San Francisco. The Revenge—from Neapolitan history—by A. De Succa, of Central America. Portrait of Justice Field, by S. W. Shaw, of San Francisco. Portrait of "Jahn," by Charles Prosch, of San Francisco. The Logging Camp in the Coast Range; On the Rhine; Newport, New York (bathing scene); Playing School; Red Ridinghood; Winter in Nebraska; Newsboys in New York, all by William Hahn, of San Francisco. Austin Creek, by

Julian Rix, of San Francisco. "Idlewild," Lake Tahoe summer residence of Mrs. E. B. Crocker; River San Juan, Nicaragua; Afternoon on the Truckee River; Coast Scene—near Santa Cruz; Uncle Sam Mountain—Clear Lake; Lake Tahoe; Tropical Sketch; Morning on the River; Sunset on Clear Lake; Chimney Rock—after Bierstadt; Off the Coast of Peru; Beach near San Francisco; Cornelian Bay, Lake Tahoe; Suburbs of Sacramento; Coast Scene near Pescadero; Big Tree Grove, Santa Cruz; Down the Coast; Mt. Diablo, spring time; Rio Obispo, Isthmus of Panama; A Tropical Afternoon; Scene in Nicaraugua, all by Norton Bush, of Sacramento. Lake Maggiore, Italy, by Paul Weber. Silver; Apples; Apples, second piece; Still Life; Crystal, all by S. M. Brookes, of San Francisco. Hard Road to Travel, by William Hahn, of San Francisco. Portraits, Mrs. Strong and Dr. Hentz, by Joe Strong, of San Francisco. Training the Puppy Regardless of Cost; Ophelia; Portrait of a Lady; Light and Shade; On the Beach; Quail Shooting; Flirting on the Road; Arab Girl, all by E. Narjot, of San Francisco. Mary Stuart's Last Confession; Explaining the Problem, both by Henry Raschen, of San Francisco. Norway Fiord, by Samuel G. Phillips. Still Life, by Miss M. Jones, of San Francisco—one of the pupils of the School of Design. Life's Young Dream—after P. A. Cot; Bear River, Nevada; Mountain Stream, Sierra Nevada; three crayon portraits; one landscape in oil, all by W. T. Jackson, of Sacramento. Mazatlan; Landscape; both by F. Schafer, of San Francisco. Two portraits in hardened clay, by Emil Lund, of Sacramento. Childhood—after C. L. Vogel; Youthful Gambols, Hottenroth; German Interior, F. Wendler; Flowers, Miss Williams, of San Francisco; Sleeping Beauty, Walther; Scene in the Alps, C. Millner; Grandma's Gift, Most; Whoa, Emma, Charles C. Nahl; Tonsorial Studio, Aug. Hego; Morning Prayers, J. M. Hoffman; Portrait of General Grant, F. Pebbles; Two Portraits, on marble. The thirteen last named are from the gallery of Mrs. E. B. Crocker, of Sacramento. Photograph, in oil, by Miss Julia Ostrom, Sacramento. Love's Young Dream; Our Puss, crayon drawing; Crayon Photo; My Partner in the Dance, pastel painting; Flowers, in oil; On Guard, pastel; The Wounded Dove, in oil; Portrait, in oil; Crayon Portrait; Crayon Portrait; Photo, in oil; Photo, in oil; Portrait, medallion; Portrait, in water colors—all by Miss Julia Ostrom, of Sacramento. Charcoal Drawing from Life; Charcoal Drawing; Charcoal Drawing from Life; Charcoal Drawing; Tropical Scene; Flowers; Flowers, second piece—all by Miss Amanda Austin, of Yolo. Tropical Scene; Tropical Scene, second piece; Flowers, in oil; Flowers, in oil—all by Miss Flora Weeks, of Sacramento. Black and White, in oil, as follows: South Pacific Coast Railroad Crossing, and Footbridge, over the San Lorenzo River, at the Big Tree Grove, Santa Cruz; Scene on the South Pacific Coast Railroad, showing toll-road to Felton and San Lorenzo Creek, Santa Cruz; Orphan Rock (Tasmania scene), between the mountains Gog and Magog, Australia; Big Creek Waterfall, seventeen and a half miles from Santa Cruz; Upper Merced, Yosemite Valley scene; Santa Cruz Beach Scene, near Natural Bridge; Humboldt Palisades; Snowy River, Australia; Snowy River, at a distance; Cathedral Rock, Yosemite Valley; Santa Cruz Mountains, near Los Gatos, on South Pacific Coast Railroad; Natural Bridge, near Santa Cruz—all by Alma Woodleigh, Santa Cruz. Mount Washington, and Sleepy Hollow, on the Hudson River—two pictures by Blehman, owned by Mrs. J. R. Hudson, of Sacramento. View on the Sacramento; Rio Grande, Panama; View near Sacramento; Tropical Morning; Tropical Moonlight; Autumn Scene; Painting, on plaque; Landscape; Wood Scene; Landscape—all by Miss Flora Carroll, of Sacramento. Chinese Consul-General, by F. M. Pebbles. Portrait, crayon, by Ida Elkus, of Sacramento. Portrait, crayon, by Eugene Elkus, of Sacramento. Lovers' Leap (Strawberry, El Dorado County), W. J. Straight. Portrait; crayon, by W. F. Jackson, of Sacramento. There are shown about one hundred works by pupils in the School of Design, San Francisco, that we will not attempt to catalogue here. Spring; Sleeping Child; Marble Frame—all three marble chiseling—by Frederick Flohr, of Sacramento. Drawings, by Aaron H. Powers, Jr., of Sacramento. Old Dutch Farmer; Sheep; Cattle; and three others, in oil, by H. A. Dickson, of Dixon. Monogram of the English Alphabet, by J. B. Nelson, of San Francisco. Landsburg Castle, by H. A. Dickson. Portrait, crayon, by Miss J. Ostrom. Porcelain Painting, large variety, by Mrs. E. C. Bingay and pupils, of Sacramento. Cameo Pictures, by Mrs. Katty Walther, of Sacramento. Drawings, by pupils of Mrs. E. C. Bingay, of Sacramento. Pencil and Crayon Drawings, by Amelia Klippel, of Sacramento. Crayon Drawings, by Mrs. L. H. Wells, of Sacramento. Pencil Drawings, by Mrs. L. H. Wells. Thirty pieces Porcelain Painting, by Mrs. M. E. McCormick, of San Francisco. Fourteen pieces Porcelain Painting, by Miss Belle Felter, of Sacramento. Twenty-five pieces Porcelain Painting, by Mrs. A. J. Perry, of Sacramento. Sixteen pieces Porcelain Painting, by C. A. Chateau, of San Francisco. Four pieces Porcelain Painting, by Eugenie Excoffier, of San Francisco. St. Julien the Trotter, presented to the State Society by the Bulletin Company, of San Francisco. Two Paintings, in oil, by Miss Clara Felter, of Sacramento.

Of the foregoing collection, pictures are for sale from the collections of the following: Charles Prosch, Mrs. Joe Strong, W. R. Freeman, Henry Clenewerck, Fred. Schafer, W. A. Coulter, F. Bouvy, A. De Succa, S. W. Shaw, William Hahn, Julian Rix, Norton Bush, S. M. Brookes, E. Narjot, Henry Raschen, Miss M. Jones, W. T. Jackson, Miss Julia Ostrom, Miss Amanda Austin, F. Flohr, Alma Woodleigh, W. J. Straight, and A. J. Dickson.

There are not as many artists represented in the exhibition this year, some of the leading artists being absent from the State, but the gallery exhibit is quite as full in number of pieces. The superintendent of the gallery will keep it open to-morrow all day, to answer to any who desire to purchase the art works for sale.

AT THE PARK.

Yesterday at an early hour quite a multitude was present to witness the ladies' equestrian tournament. The crowd did not diminish any until the termination of the races in the afternoon.

THE LADIES EQUESTRIAN TOURNAMENT.

An immense congregation of people assembled at the Park from nine to ten o'clock A. M. yesterday, to witness the ladies' equestrian tournament. Great interest was manifest in this exhibition, and not less than four thousand people were present to look on and form judgments as to the grace of the ladies in the saddle and their skill in managing horses. Director George W. Hancock had special charge of the tournament, and received efficient aid from President Larue, Superintendent Flint, Directors Boggs, Jones, and other officers, and Marshal Bryte and assistants. As a result everything was well managed, and the tournament was "worked off" according to programme. It was announced for nine o'clock A. M., but this was an error, as ten o'clock was the hour fixed. This error occasioned the people some trouble, and involved an hour's rather annoying wait. At ten o'clock A. M. the ladies to compete were called to the track and introduced to the judges. The Judges were E. W. Maslin, A. G. Folger, Sid. Howell, Dr. Belton, G. Valensin, C. W. Clarke, W. E. Hale. The lady contestants were Miss Anna Lovdall, Sacramento, habit, colors blue and black; Miss Kate Cross, Yolo, dark blue and black costume; Miss Minnie Perry, Sacramento, black habit; Miss Vivia Slight, Sacramento, black costume; Mrs. May Stevens, Sacramento, costume, navy blue, with white hat; Miss Ella Mouton, Sacramento, black costume; Miss Belle Ellis, Sacramento, navy blue costume. All the ladies were well mounted on spirited animals.

The Judges then gave them their instructions, and they were then conducted by Mr. Hancock to the lower turn of the track, and from that point rode, by his direction, up and down the quarter-stretch. They went in a group, by twos, and threes, and singly. They were required to make their horses gallop, canter or amble, run, wheel, halt suddenly, etc. At the conclusion of these exercises they were allowed to ride at will, and show off any special accomplishments as horsewomen. Miss Cross, who has won many first premiums, and who was in the tournament only to oblige the public and not as a competitor for a prize, then put her horse through his best paces, causing him to rise suddenly, halt suddenly, wheel, leap quickly into the air, and finally to jump over the hurdle. This was well done, the animal, under the skillful guidance of the young lady, springing almost from a "standstill" directly upward, and then forward, and alighting on all four feet almost simultaneously. Again he would be required to take a running leap, and again a quick darting leap, and again a lifting leap, with his forefeet striking the ground on one side of the hurdle but an instant after his hind feet left the ground on the other side. The other ladies then rode their horses at the hurdle and made them take the leap, though none of them had practiced with the animals in this line. This exercise greatly pleased the audience, and the applause was long and loud. Director Hancock bantered Marshal Bryte to leap the hurdle from a standing jump, and the Marshal, after a long look at the hurdle, which was a six-inch board upheld by two special policeman, a glance at his stout legs, and a pressure upon his capacious lungs, concluded he might get something out of gear inside if he tried it, and declined the wager, whereat the people roared with laughter; but they fairly shouted when Mr. Hancock mounted a heavy charger and charged at the hurdle, to show the "girls" how to do it. The horse took the leap, and so did Mr. Hancock, and nearly a day of daylight shone between the saddle and the rider as the horse struck the ground, while the weighty Director was somewhere up in mid-air. Half an hour after, some of his brother Directors went about innocently inquiring if brother Hancock had come down yet. This hurdle sport, in truth, was very amusing, and was the life of the forenoon. While the Judges were consulting, little Mary McFadden, of Yolo, rode upon the track on a rat of a mouse-colored pony, and made the "horse for a bit" show off his best paces. The Judges then announced the awards, complimenting the ladies, and truthfully saying that they all rode gracefully, managed their horses with marked skill, and had cause to be proud of their accomplishments as equestriennes. They thanked Miss Cross for appearing, and paid a warm tribute to her excellence as a rider. Mr. Maslin, as the spokesman of the Board of Judges, announced the decision as follows: First choice of prize to Miss Mouton; second, Miss Slight; third, Miss Perry; fourth, Miss Lovdall; fifth, Miss Ellis; sixth, Mrs. Stevens; for May McFadden, honorable mention and recommendation to the Directors. This closed the tournament, for which Mr. Hancock had labored for a long time, having secured, through his personal exertions, the contributed prizes.

The ladies who rode in the tournament last evening chose the following prizes: Miss Mouton took the money prize of fifty-five dollars, offered by the society; Miss Slight took the saddle presented by Stone & Co.; Miss Perry took the silver cake-chariot presented by W. K. Vanderslice; Miss Lovdall took the toilet set presented by H. Wachhorst; Miss Ellis and Mrs. Stevens have not yet made selections. The Board will present Miss May McFadden the ivory-handled whip contributed by J. T. Stoll. They have not acted on the recommendation of the committee of a special prize to Miss Cross.

THE RACES.

There was an unusually large attendance at Agricultural Park yesterday, considering that Friday is generally considered as an off-day, and especially as the two first races were looked on as almost a foregone conclusion. First on the programme was a purse of $1,200 for the 2:30 class, in which Crown Point was held first choice at $60 against $15 for the four others contesting with him, namely, Major, Cassie Mack, Capt. Jenks, and Susie, the latter alone being considered likely to make a struggle with the favorite. As the horses scored, it was perceived that the driver of Cassie Mack had a pistol of horse-marine power protruding from his hind pocket, and a great deal of merriment was caused when Marshal Bryte objected to such an armed coalition, and Dave McCarthy was obliged to return to the scales to make his weight good. The admirable manner in which this new method of the drivers as well as the horses being heeled was squelched, merits the approbation of the entire community. As was expected, the race resulted in a match between Crown Point and Susie, the former leading the entire circuit, but Susie so pressing him at the wire that there was but half a length between them, all the others being distanced, the Major when last caught sight of, occupying the rear position at about the three-quarter mile pole. Time, 2:28. The betting was now $80 to $15 in favor of Crown Point, and this time Susie was bound to make her effort, and at a clipping gait she reached the half mile first by a length, and thence she led well to the drawgate, when she was off her feet, and dancing and pirouetting from side to side. Crown Point won in a jog in 2:26¾. The little betting there was might be classed as $60 to $10, the sporting men taking the long odds; and although Susie again made a good struggle to the drawgate, there again she made a bad break, and Crown Point won the heat and race in 2:28.

SUMMARY.

Agricultural Park Course, Sacramento, September 24, 1880.—Trotting—2:30 class; purse, $1,200; first horse, two thirds; second, two thirds of remainder; third, the balance.

A. B. & L. K. Whipple name ch. s. Crown Point, by Speculation, by Rysdick's Hambletonian, by Abdallah; dam Young Martha, by Geo. M. Patchen, Jr.	1	1	1
Robert Beck names s. m. Susie, by Geo. M. Patchen, Jr.; dam Santa Clara	2	2	2
D. McCarty names b. m. Cassie Mack, by McClellan; dam Sebella	dis.		
N. A. Covarrubias names b. g. Major—unknown	dis.		
Ben. Timmons names G. Valinsin's b. g. Capt. Jenks, by Norfolk; dam by Belmont	dis.		

Time—2:28, 2:26¾, 2:28.

The next race on the programme was the two mile and repeat trotting for a purse of $1,200, in which Lady Ellen was an immense favorite at $100 against $20 for Tom Stout, and $30 for the field, comprising Venus, Mollie Drew, and Bessie. From the start it was evident that Lady Ellen was laying up the heat, as she was far in the rear at the first half, and never appeared to try to better her position. The fight was thus virtually left to Venus, Tom Stout, and Mollie Drew, the former leading at the end of the first mile, with Stout close to her, and so they traveled almost to the wire, where the latter horse, who got on a run, had to relinquish the second position to Mollie Drew, Lady Ellen being driven leisurely in, with Bessie distanced. Thus occurred the first curious result in betting that made this a hazardous day for those who were not well informed as to the real merits of the horses—Venus, or rather the field, selling for $125 against $35 for Lady Ellen, and $25 for Tom Stout. Again the Lady played a waiting race, Stout leading at the half-mile a length from Venus, but thence Ellen gradually closed up and passed the wire in the first mile on almost even terms with the two leaders, and then, taking the lead, she had all the others speedily in difficulties, and won, as she liked, in 5:04½; Venus second, and Mollie Drew third. It was now $120 on Lady Ellen against $10 for Stout and $40 for the field. The heat needs no description, save that the Lady sailed away, opening a gap of from twelve to twenty lengths, and winning, in a jog, in 5, Venus beating Mollie out, by a neck, for second place, and Tom Stout being distanced, and in the order mentioned the purse was divided.

SUMMARY.

Agricultural Park Course, Sacramento, September 24, 1880.—Trotting—2:40 class; purse, $1,000; two miles and repeat; first horse, two thirds; second, two thirds of remainder; third, the balance. Deitz mare barred.

D. J. Green names b. m. Lady Ellen, by Carr's Mambrino; dam by Owen Dale	4	1	1
Ben. Timmons names G. Valinsin's ch. m. Venus, by Venture; dam unknown	1	2	2
James Price names ch. m. Mollie Drew, by Winthrop; dam Fanny Fern	2	3	3
John Williams names L. U. Shippee's blk. g. Tom Stout, by the Moor; dam by Argyle	3	4	dis.
J. T. McIntosh names br. m. Bessie, by Blackbird; dam Kate Signal, by Old Signal	dis.		

Time—5:04, 5:04¼, 5:00.

The final race, a divided purse of $360 for four-year olds and under, was the most interesting race of the day, as in it there came together those doughty antagonists of the previous State Fair—ex-Governor Stanford's Captain Smith and L. J. Rose's Del Sur, the result last year proving to be in favor of the latter, although it was then acknowledged that Captain Smith was the better in speed, and lost mainly in consequence of the difficulty Charles Marvin had to hold him in control. Then the accounts from Palo Alto were so favorable as to Captain Smith's training, that after some even betting he was made first choice at $165 to $135, at which odds the betting was very heavy. At the second attempt the bell was tapped, Marvin, at the pole, accepting a start in which he had somewhat a length the worst of it, and as Del Sur immediately opened up a gap, which was gradually increased to three lengths at the half, in 1:16, it was evident that the Captain was making a waiting race of it. On the upper turn Marvin gradually closed up on Del Sur, and pressing him. On entering the homestretch Del Sur was off his feet, and a couple of hundred yards further made a repetition, and Captain Smith came in an easy winner by two lengths, in 2:29. There was now a change in the pools, the Captain selling from $100 to $50, and again Del Sur, on sufferance, took the lead, and trotting very squarely had opened out a gap two lengths at the half mile, in 1:13, showing a great improvement of speed on the previous heat, but as Captain Smith gradually came up and down the homestretch the horses seemed to be almost on even terms, but in this instance appearances are very deceptive, and Del Sur having always the best of it, won in good style in 2:25, Captain Smith being eased up when the struggle was hopeless. The betting now began to be very wild and irregular—but as an average pool must be mentioned—$120 to $30 on Del Sur. The third heat was of a very varying character, Del Sur, as usual, taking the lead, and at the quarter there was full daylight between the two, but approaching the half he broke, and Smith at that post was a length ahead, in 1:14, but approaching the last turn, Captain Smith was off his gait, and Del Sur jogged in easily in 2:28. The fortunate backers of the so deemed unfortunate Captain were now at their wit's ends to get even, and they rushed up the pools to $200 to $20, and one pool was $300 to $25, which, deducting the commission, was simply twenty to one that Del Sur prove the victor. Again he assumed the initiative, and at the half in 1:16½ had a length the best of it, but a bad break on the turn more than lost him his advantage, and the two came down the stretch lapped together the entire distance, with the advantage always in favor of Captain Smith, who broke just as he passed the wire on a run by half a length in 2:32. It was still $100 to $35 on Del Sur, although it was evident that Captain Smith was the steadiest in his gait, and with darkness setting in the horses were sent off for the final heat, on which some $20,000 was depending, and they trotted evenly until round the back stretch, when the Captain was seen to be drawing away, on which under stress Del Sur was off his feet, and the Captain was in the lead at the half in 1:16¼, but the race was not yet over, for Del Sur again closed on his antagonist, and was on even terms with him at the last turn, but again Del Sur made a bad break, and Captain Smith won a hard fought struggle in 2:33. It was a magnificent race, and it will be years and years again before the memory of the contest when Captain Smith turned the tables on his former victor will be forgotten.

SUMMARY.

AGRICULTURAL PARK COURSE, SACRAMENTO, September 24, 1880.—Trotting—Four-year old or under class. Purse, $300; first horse two thirds, second two thirds of the remainder, third the balance. Steinway barred.

H. R. Covey names L. Stanford's br. g. Captain Smith, by Locomotive; dam, Maid of Clay, by Henry Clay	1	2	2	1	1
L. J. Rose names blk. s. Del Sur, by The Moor; dam, Gretchen, by Mambrino Pilot	2	1	1	2	2

Time—2:29, 2:25, 2:28, 2:32, 2:33.

SIXTH DAY.

[From Daily Record-Union of Monday, September 27th.]

The State Fair closed about eleven o'clock Saturday night with the closing of the Pavilion. The week was a successful one; the people came doubtful, but went away satisfied, and the unanimous verdict is that the State Fair was in all respects a success worthy of California. More than this they could not say, for California is worthy of an exhibition each year in her name of the highest character possible to be attained here.

AT THE PAVILION.

The interest manifested by visitors at the Pavilion continued to the last moment of the Fair. The attendance was exceedingly good. The music was good, and was frequently encored by the audience. During the evening O. P. Dodge, the Assistant Superintendent at the Pavilion, was called into the office of the Secretary of the society, and presented by the exhibitors with a very handsomely written testimonial of their appreciation of his tireless efforts to assist them in every way possible, in exhibiting their goods, etc. The receipts of the society for eighteen hundred and eighty were gratifyingly large, as the following table will show:

	1879.		1880.	
	Park.	Pavilion.	Park.	Pavilion.
First day	$1,657 50	$1,743 50	$2,445 75	$2,654 00
Second day	1,331 00	762 00	1,611 00	1,165 50
Third day	1,576 00	650 00	3,144 45	1,234 00
Fourth day	1,771 00	845 00	2,431 50	808 50
Fifth day	3,822 25	538 00	1,786 00	622 75
Sixth day	1,064 70	326 00	2,137 20	375 85
Totals	$11,222 45	$4,864 50	$13,555 90	$7,860 00

The sum total for eighteen hundred and seventy-nine was sixteen thousand and eighty-six dollars and ninety-five cents; for eighteen hundred and eighty, twenty-one thousand four hundred and sixteen dollars and fifty cents. The total excess, therefore, for eighteen hundred and eighty over eighteen hundred and seventy-nine was five thousand three hundred and twenty-nine dollars and fifty-five cents.

At eight o'clock Saturday evening Thomas Guinean, the inventor of Guinean's Universal Refrigerator, opened the one on exhibition in the lower hall, and took therefrom beef, poultry, mutton, etc., placed therein six days before, and when the meats were already two days old. They were found to be sweet, without taint, and perfectly preserved, and on thrusting one's head into the refrigerator chamber no odor of decomposition was noticeable, and the interior was found to be as dry as a bone, not the slightest moisture being found on the walls of the receptacle. It proved the refrigerator to be all that its inventor claims for it.

The hats announced by the Misses Brothers to be given away to ladies who registered names at her millinery section in the upper hall, were awarded by lot Saturday night, and were won by Lizzie Heary, No. 1,705; Miss Sue M. Lindsey, No. 1,693, and Miss Rosa Fox, 1,587. The hat to be given away by Mrs. Katzenstein was won by Mrs. C. Rose, Ninth street, between K and L. The number was 652.

THE RACES.

The races Saturday were very fine. They eclipsed those of any day of the week in real interest to the public and to horsemen alike. The attendance was excellent.

The first race was trotting, free for all, for one thousand dollars, and the horses were Nutwood and Santa Claus. The pools sold Santa Claus, fifty dollars; Nutwood, seventeen dollars. Nutwood had the pole. He broke at the start, and also at the turn, running clear round to the opening of the backstretch. Santa Claus broke half way to the quarter post, and lost ground. Nutwood then pushed to the front, and kept it by seventy yards, gaining the position by a splendid burst of speed. He won the heat under a pull in 2:22. The quarter was made in 37 and the half in 1:11.

Before the next heat Brigadier and his colts Grenadier and Brigade were speeded on the stretch.

In the second heat Mr. Finigan gave the reins over Santa Claus in charge of Budd Doble.

The horses went about the turns steady, and at the quarter were neck and neck, when Nutwood broke, and Santa Claus took the lead. Nutwood ran again on the upper turns, and again just above the drawgate, while Santa Claus jogged in in 2:19¾. The half was made in 1:10, and the quarter in 33.

Next came the speeding of the handsome two-year-old filly Sweetheart against the best time of her class, 2:31, for the society's gold medal. She went alongside of Nimrod as a teaser, and made never a skip, but trotted as handsomely and squarely as the most exacting could desire. There was great cheering when President Larue announced that she had made the best two-year-old time in the world, 2:26½, and that in addition to the society's gold medal she was to be given a gold cup worth three hundred dollars, for her wonderful achievement, the gift of a private individual. Sweetheart made the quarter in 37 seconds, and the half in 1:13.

In the third heat, Santa Claus got a bad send-off, and near the quarter broke and lost very badly. Nutwood flew off his feet also on the backstretch, and the thermometer of his friends' hopes, so high a moment before, suddenly indicated zero. However, on the homestretch, the chestnut stallion did some excellent work, and came in winner of the heat by a neck, amidst wild cheering by the spectators. Time, 2:24½. Just before this heat, the premium stock from Governor Stanford's Palo Alto stables was paraded.

Santa Claus won the fourth heat, in 2:21¾, without difficulty, Nutwood a poor second. In the fifth and last heat, Mr. Knox took the reins in hand over Nutwood. Santa Claus led. Nutwood flew off his feet just on the turn, and again on the upper turn, leaving Santa Claus the heat and race in 2:21. The half mile was made in 1:09½.

SUMMARY.

Agricultural Park Course, Sacramento, September 25, 1880.—Trotting—Free for all classes—purse, $1,000.

P. A. Finigan names br. s. Santa Claus, by Stratmore, dam by Williams' Membrino	2	1	2	1	1
J. W. Knox names ch. s. Nutwood by Belmont, dam Miss Russell	1	2	1	2	2

Time—2:22, 2:19¾, 2:24½, 2:21¾, 2:21.

The next race was a half mile running scramble for two-year-olds, between Appleby's Laura Winston, Winters' Countess Zeka, and Judson's May D. Laura had the poll, May D. second. Laura led, with May D. at her shoulder, and Zeka last. At the score the leaders were nearly neck and neck, and only by a nose did May D. win over the favorite in the pools. Time, 0:51.

SUMMARY.

Agricultural Park Course, Sacramento, September 25, 1880.—Running—Half mile scramble for two-year-old fillies; $25 entrance; $10 forfeit; $100 added; second horse saves stake.

L. M. Darling names J. & H. C. Judson's ch. f. May D., by Wildidle, dam Hettie Brown	1
William L. Appleby names s. f. Laura Winston, by Norfolk, dam Golden Gate	2
Theodore Winters names b. f. Countess Zeka, by Norfolk, dam Ballarena	3

Time—0:51.

Next came a running race for three-year olds, one and three-eighth mile dash, between Tyler, Nighthawk, Douglas, Sallie Black, and Wild Idler. Tyler led, with Nighthawk next, and Douglas third. At the three-quarter post, by a splendid effort Sallie Black came to the front, and at the score, a neck ahead of Nighthawk, won in 2:24¾, Tyler third, Idler fourth, Douglas last. In this race Nighthawk had sold favorite for $112 to $55 for Black, $20 for Idler, and $11 for the field.

SUMMARY.

Agricultural Park Course, Sacramento, September 26, 1880—Running Stake—One and three-eighth mile dash for three-year-olds; $100 entrance; $25 forfeit; $300 added; second horse $100, third, $50; penalties same as in one and one-eighth dash, except winner of that race to carry seven pounds extra.

P. M. Chatterton names g. m. Sallie Black, by Waterford; dam Lillie Sampson	1
J. McM. Shafter names b. f. Nighthawk, by Imp. Haddington; dam Napa Queen	2
L. M. Darling names J. & H. C. Judson's ch. c. Tyler, by Wildidle; dam Lizzie Brown	3
P. Goodwin names Wild Idler, by Wildidle; dam Eva Coombs	4
John H. Cardinell names ch. c. Jack Douglas, by Wildidle; dam Lady Clare	5

Time—2:24¾.

Then came the three mile race much talked of during the whole week. Clara D. and Connor were the only starters. Connor had the pole. Clara D. was the pool favorite two to one. Clara led Connor at the quarter by fifty yards, the latter being evidently held by his jockey, a policy the boy had tried once before in the week and failed in, that of allowing the animal to trail behind with a view to a final push at the close to take first place. The first mile was finished in this way in 1:54. On the second mile at the upper turn Clara widened the gap between her and Connor considerably, but on the stretch the latter began to close it up slowly. The second mile was finished in 3:56. On the turn Connor began to gain on his leader, and half way to the half-mile post had collared in the prettiest bit of running seen for many a day, but the effort was too great for him, and he could do no more at the score than keep his nose in a line with her streaming tail, and hence Clara D. won, while the people applauded her loudly. Time, 5:33½. The best time in America is 5:27¼. In Australia it has been lowered to 5:26¼.

SUMMARY.

Agricultural Park Course, Sacramento, September 25, 1880.—Running Stake—Dash of three miles; free for all; $150 entrance; $50 forfeit; $600 added; second horse, $200; third, $100.

L. R. Martin names E. J. Baldwin's b. m. Clara D., by imp. Glenelg; dam, The Nun	1
Theodore Winters names ch. c. Connor, by Norfolk; dam, Addie C	2

Time—5:33½.

An impromptu race, not a programme affair, followed between Australia and Ironwood for a half-mile dash, and it was won by Australian in 0:51½, and was very nicely run.

HORSES AND CATTLE.

THE EXHIBITION OF HORSES, CATTLE, SHEEP, ETC., AT THE PARK.

MORE AND BETTER HORSES AND FINER CATTLE THAN EVER BEFORE EXHIBITED AT A CALIFORNIA STATE FAIR.

The State Agricultural Society has reason to congratulate itself and the public on the display of horses and cattle at the Park this season, for never before has there been so fine a one in all respects. Those who thought that the President of the United States would be the principal attraction this week in Sacramento were agreeably surprised, for they have found here an exhibition that in itself was well worth traveling hundreds of miles to witness. Every stable at the Park was filled, and it was barely possible to accommodate all comers.

THE HORSES.

The number of horses attending the Fair this year was larger than on any previous year, and in the aggregate they were a much more valuable collection. The best productions of the Pacific Coast were here, and it is well known that no better are shown anywhere. The racing record of the week will prove that few States in the Union show anything like such improvement in the breeding of horses.

The most extensive and the most valuable collection of horses at the Park is that owned by ex-Governor Leland Stanford. He has sent about thirty head of trotters, runners, and horses on exhibition from his Palo Alto stock farm, where he has about three hundred and forty blooded horses. Of the farm and the horses it is useless to speak, as they have been written up repeatedly and at length in the various sporting papers. The farm and the collection of horses are not surpassed in the world. The horses now at the Park are under the immediate supervision of Horace R. Covey, superintendent of the Palo Alto stock farm, who is ably assisted by his son Frank and a number of drivers, stablemen, and general helpers. The horses from Governor Stanford's stables this year are as follows:

Elaine, a fine brown mare, six years old, by Messenger Duroc; dam Green Mountain Maid, by Henry Clay. Previous to this week her best record was 2:24, but on Tuesday she reduced it to 2:21½.

Clay, a black gelding, six years old, by Fred. Low, dam Maid of Clay, by Henry Clay. Clay is a very promising horse, and made his first record this week, 2:28.

Captain Smith is a bay gelding, four years old. He was sired by Locomotive, dam Maid of Clay. He made a record last year of 2:22, and was entered for the special purse yesterday afternoon.

Fred. Crocker, a bay gelding, two years old, is one of the most promising colts in the United States to-day. He is by Electioneer out of Melinche. He was beaten by Sweetheart on Monday in 2:31½, but if these two colts keep up to their present promise, Maud S. will have to look to her laurels.

Glencora is a brown filly, three years old, by Mohawk Chief, dam Lady Gilbert.

Bentonia, a bay stallion, two years old, by General Benton, out of Lucetta, by Hambletonian.

Fallis, two-year-old bay colt, by Electioneer, dam Felicia, by Messenger Duroc.

General Benton, a bay stallion, eleven years old, by Jim Scott, dam by Rich's Hambletonian.

Prima Donna, bay filly, three years old, by Mohawk Chief, out of Mater Occidentus, the dam of Occident.

Waxana, chestnut filly, two years old, by John Benton, dam Waxy, by Lexington.

Monte Belle, bay filly, two years old, by Mohawk Chief, dam Swan, by Belmont.

Bijou, two-year-old bay filly, by Electioneer, dam Alameda, by Langford.

Hattie Crocker, bay yearling filly by Electioneer, dam Melinche, by St. Clair. This is another very promising colt, and a full sister to Fred. Crocker.

Bonnie is a bay yearling filly by General Benton, out of America, by Rysdick's Hambletonian.

Eros is a very fine bay yearling colt by Electioneer, dam Sontag Mohawk, by Mohawk Chief.

Clay, a brown stallion colt, one year old, by Electioneer, dam Maid of Clay—a half brother of Captain Smith and Clay. [The name of the six-year-old Clay is to be changed, and the young one will take the name.]

Beneficial, a bay stallion, one year old, by General Benton, out of Lucetta, by Rysdick's Hambletonian.

Cheatham Mohawk, gray stallion, three years old, by Mohawk Chief, dam Fleta, by Cheatham—a fine thoroughbred colt.

A brown yearling filly, not named, by Mohawk Chief, dam Wilhelmina, by Messenger Duroc.

Belle Boyd, bay filly, one year old, by Springbok, dam Boydana, by imp. Knight of St. George.

Evangeline, chestnut yearling filly, by Longfellow, out of Robin Girl, by Inquirer.

Fostress, chestnut filly, by Foster, dam Planeta, by Planet.

Conquest, chestnut yearling stallion, by Lever, dam Cuba, by imp. Australian.

Lilly, brown yearling filly, by Electioneer, dam Lilian, by Lodi.

Bay yearling filly by Electioneer, dam Barnes' Idle, by Idle.

Chestnut yearling filly by General Benton, dam Irene, by Mohawk Chief.

Occident and Abe Edgington, the well known trotters, are also in these stables, and attract much attention. The former is destined to be a favorite of the California public as long as he lives, and he bears his honors well. Both are in fine condition and show their excellent care. This stud of horses have been visited during the week by thousands of people, and the attendants have been ever ready to extend any courtesy in their power. The name of each horse was painted in large letters on a card over the door of the stall, which was a great convenience to the public in finding the horses they most desired to see. This is an idea that has been repeatedly suggested in these columns, and to the extent it was carried out this year the public were grateful.

The next largest exhibit was that of Theodore Winters, in charge of Walter Neely and Henry Welch. Mr. Winters has been for a great many years one of the largest exhibitors, and as the owner of Norfolk, has brought to the Fair each year some of the best running stock in the United States. His stables are always visited by crowds of people, especially those who wish to get "points" for the races. He has this year:

Joe Hooker, a chestnut stallion, seven years old, by Monday, out of Mayflower, by Eclipse.

A yearling stallion by Norfolk, dam Ballinet—a beautiful colt.

"305," bay stallion colt by Norfolk, dam Addie C. by Revenue, a full brother to Connor.

Farallone, bay yearling filly by Norfolk, dam Golden Gate by imp. Lexington—a perfect beauty.

Mamie Hanlon, a chestnut filly, by Norfolk out of Mattie A., by imported Australian.

Duchess of Norfolk, bay filly, by Norfolk; dam, Marion, by Malcolm.

Addie C., and suckling colt by Norfolk. Addie C. is by Revenue; dam, by Bob Johnson.

Mattie A., and sucking colt by Norfolk. The mare is out of Australian out of Minnie Mansfield.

Bay mare Marion, by Malcomb; dam, Maggie Mitchell.

Queen, gray mare, nine years old, by Norfolk; dam, Duces, by Bulwer.

Flood, bay stallion, three years old, by Norfolk, out of Mollie McCarty, a colt that gives excellent promise.

Neapolitan is a dark bay, four year old, by War Dance, out of Eliza Davis, by imported Knight of St. George.

Duke of Norfolk, two-year old chestnut colt, by Norfolk, out of Marion, by Malcomb.

Fred. Collier, two-year old stallion, by Joe Hooker; dam, Sorrel Puss, by Norfolk. This colt won the two-year old race, mile dash, this week, in 1:45½.

Bay filly, two years old, by Norfolk; dam, Bellerina.

Mattie Glenn, chestnut mare, five years old, by imported Glen Athol; dam, Mattie Cross.

Connor, chestnut colt, three years old, by Norfolk; dam, Addie C., by Revenue.

W. M. Sparrow, of Georgetown, Sacramento County, exhibits a two-year old Norman stallion, sired by Idle; dam, by John Bull. This is a very fine iron-gray colt, weighing one thousand four hundred and ten pounds, and took the first premium in his class.

T. J. Hutchinson has a fine white Norman stallion, named Mark Durham, four years old.

G. C. Mullen exhibits in the roadster class a very fine bay stallion, two years old.

W. O. Jennings, of Black Station, Yolo County, has a fine stud of horses in charge of W. M. Millsap. They are as follows: Two-year-old stallion Tempest, sired by Yolo Dave, dam Kate; Kate, a fine bay mare with a sucking colt, Baby Mine, by Yolo Dave; Yolo Dave, nine years old, dapple stallion, by Uncas, out of a thoroughbred mare; Dalrymple, four-year-old stallion, by Yolo Dave, dam three-quarter bred, half brother to Tamarac, a dark iron-gray, and a very fine piece of horseflesh; Lady Long, three-year-old iron-gray mare, sired by Yolo Dave and out of a common work mare; four-year-old mare Fancy, by Yolo Dave, dam the half-bred trotter Lucy.

Andrew Naramore of Penryn, Placer County, has on exhibition the four-year-old stallion Young Planter. He is a dark bay with a white stripe in his face, and is a very fine trotting colt.

John Landis, of Wheatland, Yuba County, has a fine pair of roadsters, Belle and Nell. They are brown mares, six years old, and very fast.

H. Stegall shows Georgie Stegall, a fine two-year-old bay mare.

A. W. Gabriel exhibits a carriage team, four and five years old, Lucy and Kate.

D. McCarty, of Oakland, has a fine stable of horses, as usual. He has at the Park a brown and bay Patchen team, Joe and Harry, six and seven years old. They took the first premium. Hancock, a fine six-year-old gelding by Hambletonian, out of a Belmont mare. Carrie F., by Owen Davis, dam, a full sister of Onward. Nell Crockett, out of a Blackhawk mare. Cassie Mack, by McClellan, dam Sebella. This mare took the first premium for finest three-year-old roadster and was entered in the 2:30 class. Alice Garrett, by Reuben, dam Minnie Tyrell. Washington, a brown stallion, eight years old, by Patchen, dam a Belmont mare. Lady Gertrude, a fine bay mare of unknown pedigree. She turns the track almost anywhere in the twenties.

C. Halverson, of Routiers Station, has a fine stable of horses, as he does every year, with the well known stallion, Bayswater, at the head of the list. This horse is now seventeen years old, and his numerous progeny do credit to the old chief. Franklin is a fine dark chestnut stallion, five years old, by John Bull. Queen, a four-year-old John Bull mare, full sister to Franklin, has by her side a fine colt by Bayswater. Lady Grant is a very fine four-year-old brown mare by Black Ralph. Belle, sired by Bayard, a son of Missouri Chief, has a sucking colt of Bayswater at her side. Bayswater, Jr., a yearling stallion, promises to be a worthy son of an excellent sire.

P. J. Shafter enters the four-year-old trotting gelding Sunbeam.

R. B. Milroy has the roan gelding Tommy Dodd, by Alexander, dam a Clay mare.

L. J. Rose has at the Fair this year Sir Guy, a bay gelding four years old, by the Moor, dam by Stormy King, a quarter-horse; Del Sur, four-year-old stallion by the Moor; and Sweetheart, by Sultan, he by the Moor, dam Minnehaha. This two-year-old filly is the one that won the two-year-old race on Monday in 2:31½.

E. Comstock has a fine display of Clydesdale draft horses, including May, a four-year-old mare by Sir William Wallace; Maud, a five-year-old mare, wearing the blue ribbon of the first premium in her class; Poll and colt, also wearing the blue ribbon for first premium in their class; Prince, a very fine three-year-old Clydesdale stallion; Coaly and colt, a black mare, eight years old, by John Nelson, out of a Hambletonian mare; and Queen, a yearling colt by Gray Eagle, dam Maud.

J. A. Polhemus has a two-year-old filly named Nellie; Snap, a yearling stallion; Flora and colt, and Daisy and colt—all very fine.

A. J. Ogden, of Wheatland, Yuba County, has Young Tam O'Shanter, a four-year-old bay stallion by Tam O'Shanter, dam French and Clydesdale. He weighs one thousand eight hundred and thirty-five pounds, and took the second premium in the draft-horse class. Also, pair of working mules, Lize and Nan, on which he took the first premium.

William Bandeen has the two-year-old gray stallion Selim, sired by Porter's Norman, dam Tecumseh and St. Clair. This two-year-old weighs one thousand four hundred pounds, and is a perfect beauty. Also, the saddle horse Trim.

T. Van Vechten has the eight-year-old stallion Combination, by Vibrator, dam a thoroughbred mare by Woodpecker, out of Martha Washington.

Fred. Babel exhibits a four-year-old horse of all work named Fred. Babel. He is a fine gray stallion, and attracts a good deal of attention.

Manuel De Costa shows Tom Lawton, a very fine Norman stallion, two years old, weighing one thousand two hundred and thirty pounds.

L. G. Butler exhibits a three-year-old sorrel mare called Belle Garfield.

H. S. Beals has Duchess, by Great Western, by Hambletonian.

W. H. Neely has the nine-year-old stallion Gray Eagle, entered in the class for horses of all work.

J. L. Clark exhibits a fine team of roadsters, Ethan Allen and H. W. Beecher, ten and seven years old; Belle Clark, a four-year-old mare, and Fannie and colt.

F. C. Neal has Robert Bruce, Junior, a fine bay stallion, four years old. Also, Idle, Junior.

T. I. Skillman exhibits Tornado, a bay stallion, four years old, sired by the imported Norman stallion, St. Laurent. He weighs one thousand eight hundred and eighty-six pounds, and is a fine, well-proportioned animal. Also, Gypsy and a suckling horse colt. The latter took a second premium.

H. Webster exhibits the stallion Jack Nelson in the class for horses of all work.

Peter Peters has a fine mare called Lizzie.

George L. Culberson, of Capay, Yolo County, took a first premium on his six-year-old jack, Kentucky Star.

J. H. Du Bose exhibits Forrest and Buckingham, a fine sorrel and black team, six and seven years old.

G. Leroux, of Tehama, exhibits Tehama George, by Signal Chief, out of a Morgan mare. He is a dapple bay, five years old, and one of the finest horses at the Park.

John Pfau, of Petaluma, has Lizzie May, a three-year old bay mare, sired by Eureka. She took the first premium in her class. Also Eureka, a bay stallion, four years old by Walnut Bark, dam by Laplander.

T. C. Perkins has Annie and colt, and Victoria and colt; both fine mares with promising colts.

C. Luce exhibits Lady Low, a four-year old roadster by Fred. Low, dam by old St. Clair, granddam by Belmont.

A. Sackrider exhibits French Spy, a very fine gray stallion; also Rocky, an iron gray stallion, four years old.

W. H. Coombs, of Napa, has two colts by Shannon, dam by Lodi; also, the three-year old filly Tilly C. by Wildidle, dam by Don Victor.

Wilbur Pierce has a two-year old filly by Shannon, out of a Lodi mare; bay filly Carmelita, three years old, by Lodi, out of a Cheatham mare; brown colt, three years old, by Langford, out of a Lodi mare.

Lew. Ramez has Ironwood, a six-year old stallion by Ironclad, out of Iola.

Frank Coombs, of Napa, has Shannon, an eight-year old stallion, a full brother to Mollie McCarty.

Frank De Poyster has Bessie Sedgwick, chestnut mare, four years old, by Jo. Daniels, dam by Starlight; two-year-old sorrel filly by Jo. Daniels, dam by Woodburn; two-year old bay filly by Specter, dam Pet, by Young Melbourne; Jack Dowdy, three-year old bay colt by Leinster, dam by Woodburn.

Charles Murphy, of San José, has Sam. Boring, a very fine bay stallion, by Wildidle, dam by imported Hercules; Mary Watson, eight-year old mare, sired by imported Hercules, dam by Independence, by Boston; Brown Kitty and a sucking colt, sired by Bob Woodin, dam Mary Watson.

L. Whitmore has Brightwood, a three-year old bay stallion, by Norwood, out of a Lancet mare. He turns the track in 2:50.

R. Coil, of Woodland, exhibits Blackwood, a two-year old black stallion, by Reaves' Blackbird, out of a Blackhawk mare.

George Carey exhibits the two-year old jack, Henry Ward Beecher.

E. R. Lyle exhibits a four-year old jack, called Golconda.

A. C. Bingham, of Woodland, exhibits Charley and John, a fine pair of roadsters, six years old. They are very closely matched, and can trot together in 3:30.

D. Gannon exhibits a four-year old called Gypsy Huntington, by Emigrant, and Pat. Hunt, by Tecumseh, dam a St. Clair mare.

George Howson has Jim Snowden, a seven-year old sorrel horse by Bloomsbury, out of a Norfolk mare, and Jack Douglass, a two-year old bay stallion by Wildidle, dam a Norfolk mare. The former was beaten by a neck one day this week in 1:42¾.

P. H. Murphy, of Brighton, has a half-breed Norman colt, Gray Eagle, weighing one thousand one hundred and ten pounds. She is out of an Eclipse mare, and a powerful animal. He also shows a matched span of carriage horses, coal black, by Black Eagle.

R. J. Merkley, of Sacramento, shows a Norman mare and two of her colts, both of which are on the Stud Book. One, a yearling stallion, weighs one thousand three hundred and thirty pounds, and is coal black. The sucking colt, four months old, weighs six hundred and ninety pounds. The mare weighs one thousand seven hundred and fifty pounds.

W. L. Pritchard, of Sacramento, has a very extensive exhibit, including the following: Brown yearling by Leinster out of Jenny Hull; bay filly by Leinster out of Addie H.—a sister to Patsy Duffy; chestnut filly by Leinster, dam Flush—a sister to Euchre; bay stallion colt by Leinster, dam Irene Harding; Jim Foster, two years old, by Foster, out of Flush; Frank Rhoads, two years old, by Leinster, dam Addie C.—brother to Patsy Duffy; Euchre, chestnut stallion, three years old, by Leinster out of Flush; Lena Dunbar, by Leinster out of Tibbie Dunbar; Sallie Black, three-year-old mare, by Waterford, dam Libbie Simpson; sorrel colt by Leinster out of Sophy; bay yearling colt by Leinster out of Tibbie Dunbar; two-year-old bay colt by Leinster out of Tibbie Dunbar; two-year old gray filly by Leinster out of Sophy; Bazar, seven years old, by Jack Malone out of Joy Leaf; the well-known stallion Leinster by Amsterdam, out of Lurline, and several brood mares and colts.

T. B. Winston, of Carson City, Nevada, has some fine horses in charge of Wm. Appleby. Illusion, five-year-old mare by Alarm, dam Mary Hadley; Laura Winston, two-year old mare by Norfolk, dam Golden Gate; and Betsy McGuire, bay mare, four years old, by Bois de Arc, dam Belle.

E. Denman, of Petaluma, has Demoret, a fine mare by Melbourne, dam by Scythian; and Denman, a five-year-old mare out of Demoret, by Hubbard.

M. W. Hicks has Flight, a two-year-old brown filly by Buccaneer, out of a Flaxtail mare; and Fawn, a five-year-old brown mare by Mambrino.

Henry and James Judson have some good horses in charge of L. F. Darling. May D., a two-year-old chestnut filly by Wildidle, dam Nettie Brown; Ella Doane, three-year-old bay filly, by Wildidle out of Nettie Brown; Sophy B., two-year-old bay filly, by Wildidle out of Lizzie Brown; Tyler, a sorrel stallion, three years old, sire by Wildidle, dam Lizzie Brown; and Belshaw, two-year-old bay gelding, by Wildidle, dam Susie Williamson.

J. T. McIntosh, of Chico, has Prompter, a five-year-old stallion; Bessie, brown mare, six years old, by Blackbird, dam by Signal—trotted in the two-mile race; and a five-year-old stallion by Wilson's Blue Bull, dam Prairie Bird, by Flaxtail. C. L. Denman has charge of them.

Ben. E. Harris has Dividend, a roadster stallion, two years old; Grenadier, yearling stallion; Emma, yearling mare; Agnes and colt and Lady Sylva, and a colt by Gardner.

W. E. Morris, of Stockton, has Upright, a three-year-old stallion by Whipple's Hambletonian, dam Gilroy Belle, by Lodi. He took a first premium; also, John Dodge, a chestnut stallion by Prince, dam Chieftain.

Frank Button, of Petaluma, has Alex. Button, a three-year-old bay stallion by Alexander, dam Lady Button. He won the three-year-old-race in 2:29.

Joel Merchant has on exhibition the fine stallion George M. Patchen, by California Patchen, dam a thoroughbred mare. He is seventeen hands high, weighs one thousand three hundred and eighty pounds, and has taken first premiums for family colts at eight county fairs.

Chris. Thodt, of Salinas, has Lucy, a fine mare of all-work, and Fannie, a five-year-old gray mare. The latter is nearly nineteen hands high, and weighs one thousand six hundred and fifty pounds.

William Murray has Governor, a fine four-year-old roadster, and Carolina, another four-year-old roadster.

J. B. McDonald has Brigade, a yearling stallion colt; Yuba Maid and colt; Nellie, a four-year-old mare; and Lexington Belle, a four-year-old mare.

M. D. Cooper has Rob, a four-year-old roadster.

A. W. Boyce has a fine roadster team, Nigger and Belle, four-year-olds; also Chief, a black roadster, nine years old.

W. A. Murrion, of Dixon, Solano County, took the second premium on his jack John Henry. He also exhibits Dom Pedro, Jr., a three-year-old iron-gray stallion. This horse took the second premium in his class here, and the first premium at Oakland and Petaluma.

Everett Price exhibits Johnnie Bayswater, Sallie Moore and colt, Lucy Moore and colt, and Jennie A. Garfield and colt.

Besides these there are such well-known horses as Reliance, Twilight, Nimrod, Brigadier, State of Maine, Venus, Susie, Tom Stout, Startle, Captain Jinks, Crown Point, and Washington.

Many horses were exhibited at the Fair and were entered for the races that were not stabled at the Park.

THE CATTLE.

One of the most noticeable features of the Fair is the cattle department. Although occupying the extreme far side of the grounds, the thoroughbred stock has been a constant attraction, and hundreds visit and admire day after day. The principal breeds, so far as numbers are concerned, are the Shorthorns and Jerseys, the latter being well represented this year. There is also a fine herd of Guernsey cattle, recently imported. Men who come here with their cattle from a distance, deserve success and recognition, for their expenses are very heavy, and the aggregate of premiums, however liberal, will not anyways near compensate for the aggregate expenses. For instance, one herd of shorthorns captured ten premiums. This will barely pay the expenses of the entire herd. The cattle are blanketed and bedded down as carefully as the finest racer. They are curried and groomed twice a day. Their tails are kept in good showy condition, the horns are scraped so as to give them a transparent appearance; they are fed on the best of hay and grain; the cows must be milked, and men are required to be in constant attendance. On parade days men and boys are hired to lead the animals. For instance, Colonel Younger has twenty-nine head of Durhams. The bulls must be handled by strong hands, and it requires twenty-nine men and boys every parade day—an expense of at least twenty dollars; so with all the other herds.

The first herd on the left is that of R. Noell, of Grass Valley, Nevada County, consisting of nine head of Jerseys, taken from his herd of fourteen in Nevada County. They are a fine lot of cattle, carefully bred, and beautifully marked. The cow Queen, a superb animal, wears the blue ribbon for the first premium in her class. A fine yearling bull also wears a blue ribbon. Mr. Noell imported the original stock three years ago from the islands—one bull and two cows.

P. Stanton, of Brighton, Sacramento County, exhibits nine head of Jerseys, finely bred, and of uniform color. At his ranch he has in all fifteen head. This gentleman says that the sale of Jerseys is increasing every year, and they are becoming more and more popular. The bull Romeo is a magnificent specimen. He has also a sucking calf, which wears the blue ribbon, for which he has been offered this week two hundred dollars.

Henry Pierce, of San Francisco, exhibits eight head of Jerseys, as fine a lot of cattle as can be seen anywhere in the State. They show careful breeding. One cow in particular, Pearl, attracts universal attention on account of the largest udder and best developed escutcheon of any cow that has ever come on the grounds. She gives twenty-five quarts of milk per day, making nineteen pounds of butter per week, enough for any ordinary family in the absence of buckwheat cakes. She is valued at two thousand dollars. She took the first premium in her class. A two-year-old bull also wears a blue ribbon, as also did the cow Beauty, two years old. He has also three head of Guernsey cattle, imported from the Isle of Guernsey. This gentleman last year imported ten head of these beautiful cattle, and proposes to raise a herd of them. He has a herd of about seventy head of Jerseys on his place near San José.

James Askew, of El Dorado, shows two Jerseys from the Shafter strain of Jerseys. The heifer, a very fine animal, captured the blue ribbon in her class yesterday.

Robert Beck, of Sacramento, who is the pioneer importer of the Jersey stock of cattle, has twenty-one head, young and old, from his now very extensive herd. They are of the very best strains, and under the scientific direction of Major Beck, are all finely bred animals.

George Bement, of Redwood City, shows nine head of Ayrshires, which comprises all the Ayrshires on the grounds. They are a magnificent lot of cattle, and though there are not many on exhibition, they are scattered through the State quite numerously. This herd captured seven first premiums. They have been exhibited at Petaluma, where they were awarded eight first premiums in the various classes; also, at Oakland the same number of first premiums.

E. F. Aiken, of Sacramento, shows four head of Jerseys, which, aside from being orthodox Jerseys, so far as blood goes, are very large. The bull Major took the first premium in the two-year-old class. Also, the bull calf, first premium.

Mr. Wick, of Butte County, shows sixteen head of shorthorns from his herd of eighty or ninety head. Mr. Wick breeds shorthorns for sale, and has been remarkably successful. In the entire herd there is not one spotted animal—all solid red, and a superior milking strain. This herd received premiums as follows: The bull, Major Butler, first premium; the four-year-old cow, Gem, second premium; and a first premium to the herd

General Bidwell shows two very large Durham bulls from his Chico herd. The bull Osceola, a most superb specimen, weighs two thousand five hundred pounds, which is less by one hundred and forty pounds than he weighed last year. The Duke of Chico, three years old, weighs one thousand nine hundred and forty pounds. Both bulls captured second premiums in their respective classes.

P. H. Murphy, of Brighton, has five head of Durhams and one grade. One of the animals deserves special mention—the four-months calf, Duke of Brighton, which weighs six hundred and ninety pounds. Daisy, a grade Durham cow, weighs one thousand four hundred and twenty pounds. Also, Mirandi XIV; weighs one thousand six hundred and thirty pounds.

W. K. Jones, of Tulare County, is the owner of the huge steer which leads the cattle parade. He weighs about three thousand pounds, being a Durham grade. It is understood he has been purchased by a Sacramento butcher, for Christmas beef, the price spoken of being two hundred and fifty dollars.

R. J. Merkley, of Sacramento, has eight head of Durhams. The Sixth Red Thorndale, a yearling calf, tips the scales at one thousand pounds. They are solid color, and from the best milking strains.

Coleman Younger is on hand with twenty-six head of shorthorns from his Santa Clara breeding farm. He is breeding to red altogether, and there is scarcely an inch of white in his entire herd. He has this year captured ten premiums—the sweepstakes bulls, Red Thorndale, first premium; sweepstakes, cows, Second Rose of Forest Home, first premium; Red Thorndale and three of his calves, first premium. Altogether there are seven first premiums and three second premiums. He has also twenty head of Cotswold sheep from his flock of seventy, which took premiums aggregating one hundred and fifty dollars.

Jesse D. Carr, of Salinas, shows eighteen head of shorthorns, which took three first premiums and two second premiums. The Third Maid of Monterey is a magnificent animal, and is fully entitled to be adorned by the blue ribbon, as is also the Eighteenth Maid of Monterey. The Nineteenth Maid of Monterey is a beautiful heifer calf. Mr. Carr has now on his ranch a herd of about seventy-five thoroughbred Durhams.

Mrs. R. Blacow, of Alameda County, exhibits nineteen ewes and twenty rams, all French merinos. The various pens were awarded seven first premiums.

John S. Harris, of Hollister, has one hundred head of Angora goats, the finest exhibit in this line ever made at any State Fair. Four of the animals were imported direct from Angora, in Asia. Mr. Harris journeyed to that country, and brought these goats from the interior of Asia Minor to Constantinople, a distance of seven hundred miles, on horses. They were packed on, two on a horse. They were brought from Constantinople to England, from there to Canada, and from Canada here. The wool on one of these bucks measures sixteen inches. He has in his flock about eight hundred head of full bloods, and last year he received eighty cents per pound for the mohair.

P. B. Cavanaugh has also a pen of thoroughbred Angoras.

M. Wick exhibits one pen of well-bred Angoras.

EDITORIAL COMMENTS FROM THE SACRAMENTO RECORD-UNION.

THE STATE FAIR.

The State Fair opens this year under more favorable auspices than ever before. The presence in Sacramento of the President of the United States furnishes an attraction to visitors which will largely increase the attendance, but it may be said without any fear of exaggeration that the Fair itself promises to be the most satisfactory in all respects that has been held. The evidence of increasing interest in these exhibitions is indeed very gratifying, and with the growth of that interest proceeds a commendable tendency to remove all the surviving defects and drawbacks, and to introduce novelties and reforms whenever possible. The exhibition of stock at the Park this year shows how rapidly that important interest is advancing. In former years it has been customary for exhibitors to bring more animals than space had been applied for, as there was always plenty of spare room. Now, however, it has been found necessary to restrict exhibitors rigorously to the space they have taken in advance, the applications having been so numerous that it is already doubtful whether there will be sufficient space for all of them. A special feature of interest will be the stable of blood horses sent up from Governor Stanford's breeding farm at Palo Alto. These horses are among the first products of the most thoroughly scientific system of breeding that has ever been established on the continent. The interesting experiments which Governor Stanford has entered upon could only have been undertaken by a man of equal wealth and public spirit, for while the cost of them is necessarily great, the chief profit must be reaped by the country at large, in the elevation and perfection of the various strains of horses which are being raised under the new process.

A very important change has been made in the character of the races to be run this year, and it is one which will, without doubt, be cordially approved by the public. Heretofore the time has been largely occupied by interminable three-in-five races. Sometimes one of these races has consumed a whole afternoon, and even then not been decided. Their uncertainty, tediousness, and unnecessary strain upon the horses, have rendered them decidedly unpopular, and some well-known breeders have refused to enter any of their stock in such races any more. The State Agricultural Society has wisely recognized the disadvantages of these protracted heats, and has therefore banished the three-in-five race from the speed programme altogether. This year the longest race will be two-in-three heat ones, and as a result the speed programme contains more entries than ever before, and the entertainment of the public will be very much greater. Instead of, as old, having only two races in the day, as was generally the case, it will now be possible to have four, or even five, and the public will no longer be tired out with those dreary intervals which take up so much more time than the actual trotting or running. Again, there will this year be no trouble in ascertaining what horses are about to compete, since it has been decided that drivers and jockeys must all wear distinctive colors, and neat uniforms, so that it will be easy to follow them with the eye from the beginning to the end of the race. An improved method of announcing the results of the heats has also been introduced, and altogether it is safe to say that the races this year will be more lively and interesting than they have ever been before.

The same activity and energy have been applied to the other departments of the Fair. The exhibition at the Pavilion will not only be made more satisfactory than in any former year, but it will be ready for the public much earlier. Those who know how difficult it has always been to make exhibitors get ready in time will appreciate this reform. Generally it has been impossible to get all the preparations completed before Wednesday, but this year everybody has been compelled to begin in good time, and the results are encouraging. There will be large exhibits from the Mechanics' Fair at San Francisco, and from several of the District Fairs. Efforts have been made to restrict the display of manufactures which have no State significance, and which have in the past been allowed to take up far too much room. The most useful innovations in this connection, however, are of necessity brought about very slowly, for when once things fall into a rut it is hard to move them out of it. The Pavilion exhibits nevertheless show increasing signs of improvement every year, and the display of native produce and inventions covers a larger area every State Fair. The military encampment of Colonel Dickinson's regiment adds liveliness and color to the holiday time, and will afford a new kind of interest to thousands during the intervals between the sights at the Park and the regular evening promenades at the Pavilion. Though the influx of visitors is already very much greater than at the corresponding period in former years, there is no reason to apprehend any uncomfortable crowding. Sacramento has plenty of good hotels and boarding houses, and when these are full there will be no trouble in finding accommodation in private families. It is doubtless very dangerous to say anything about the weather at State Fair times, for we generally manage to have a "warm spell" at this season, which is apt to give visitors an erroneous impression of the climate. Thus far, however, the temperature is all that could be desired, and though lovers of the turf believe that a roasting hot day is particularly favorable to fast time on the track, it is probable that fifteen or twenty thousand human beings would rather lose a second or so in the time than gain so much at the expense of their personal comfort.

THE ADDRESS OF THE PRESIDENT OF THE STATE BOARD OF AGRICULTURE.

The address delivered at the Pavilion last night by Mr. Larue, President of the State Board of Agriculture, deserves far more attention than is commonly bestowed upon such matters. It is indeed a very commendable innovation upon the usual form of agricultural addresses, for it contains suggestions and ideas which are calculated not only to assist California farmers, but to give to strangers and foreigners new conceptions regarding the resources and the destiny of this State. Mr. Larue points out the highly significant and important fact that the crops of the last season have practically disproved the soundness of the prevalent fear that our wheat lands were being exhausted by overcropping to a single staple. He shows that land which has borne heavy wheat harvests for many years is still producing with a vigor and fecundity, showing no signs of exhaustion, and his inference that the wheat yield of the State will increase until it has reached the enormous figure of one hundred million bushels appears to be justified by experience. The next question dealt with in the address is that of transportation, and here it is impossible to overestimate the value of the advice given to the farmers. It is evident that with the increase of the crops the difficulties of taking them to tide-water become greater, and that these difficulties even now practically prevent the farmer from making his market to suit himself. Dependent as he is upon Liverpool rulings, it is absolutely necessary, for his own prosperity, that he should be able to seize whatever advantages a fluctuating market offers, on the instant. But so long as hundreds of thousands of tons of wheat lie scattered all over the valleys, and so long as any rise in the market is certain to impose a sudden paralyzing strain upon the railroads, it is clear that there can be no certainty about sales, and equally clear that a large number of farmers must be liable to lose the favorable market through their inability to transport their crops. There is but one remedy for this, and it is to construct spacious warehouses at tide-water, and store the wheat there as soon as it is cut. Mr. Larue proposes that the farmers should combine and build these warehouses themselves, and there can be no doubt that in following this advice they would effect a very considerable saving in a variety of ways. It is estimated that the expense of selling the wheat, including brokerage and all cognate charges, amounts to three million dollars per annum. By far the greater portion of this would be saved if the farmers did their own warehousing, and in addition they would thus be able to take prompt advantage of any rise in the market. The speculations indulged in by Mr. Larue regarding the future of the markets for wheat and stock are in the main sound. It is already certain that Great Britain must soon cease to depend at all upon her own crops, and that she must look to this country for nearly all her breadstuffs. The case of beef cattle is, however, not yet so clear. It is true that the Western prairies can furnish beef in practically unlimited quantities, but here a question of quality has to be considered. The proportion of really fine American beef which finds its way to England is at present very small—far too small to enter into serious competition with the English stock, whose excellence is its sure protection. Wild beef cannot, at least for some time, hope to compete in that field, and it is not yet apparent that American stock raisers have decided upon adopting more careful (and consequently less economical) methods. The breadstuff market, however, is already in the hands of the Western States of the Union, and it is possible that these States may presently be able to furnish beef as well as wheat.

Mr. Larue calls attention to an advantage in wheat growing which distinguishes California above all other cereal-producing regions, namely, the dryness of the harvest season. There is no other wheat country, in or out of the United States, where the entire absence of humidity can be counted upon with absolute certainty. Here, however, we know that from June to October we can rely with full confidence upon uninterruptedly dry weather, and that our harvests will be gathered without encountering any of those dangers and injuries which constantly befall the harvests even of our Western States. And we think Mr. Larue is right in saying that this one fact marks California as a natural wheat-producing region, and as one which will always be found the best country in the world for the cultivation of that staple. This argument is in complete harmony with modern philosophy, moreover. It is the principle of adaptation to environment, which underlies the most important and suggestive deductions of Darwin and his school. Nature has always proceeded thus in the evolution of her successful species of genera, and man can never be so sure of success as when he imitates the processes of nature. We are glad to see that Mr. Larue takes a broad and sound view of the tendencies of labor-saving machinery, and that he does not fall into the errors which are so easy in this connection, of apprehending the expulsion of labor from wage-earning industries through the rapid diminution in the demand for manual help in agricultural occupations. He is undoubtedly right in assuming that the multiplication of labor-saving machines is always, and necessarily, to the advantage of labor, since it results in the production of new capital, and the consequent development of new wants, which call for an increased labor supply under more favorable conditions. As the laborer is driven from the severe toil of the harvest field, in fact, fresh occupations which offer him better wages for less exhausting work, are thrown open to him. Every labor-saving invention, rightly viewed, is a new link in the chain of progress which is lifting the masses of men above merely servile employments, and affording opportunities for the development and cultivation of their intellectual faculties. And as the life of a democratic society must ultimately depend upon the intelligence of its majority, so it is for the highest good of such a society that invention shall proceed even with leaps and bounds; nor is there anything to be apprehended by the working classes from the most complete substitution of steel and steam for nerve and muscle.

Mr. Larue completes his interesting contribution to this discussion of our agricultural future by glancing at the important changes in transportation which the completion of the Southern Pacific Railroad will bring. He shows that the road in question promises to settle the question of California's destiny as a permanent wheat-growing State, by removing the sole remaining drawback to her climatic advantages. This will be done by opening a route through which our wheat can be put down at Liverpool after a journey of from fifteen to twenty-one days, instead of the four or five months of the present system. It is needless to dwell upon the magnitude of the changes which this improvement in transportation must involve, but it will be apparent to all who read Mr. Larue's address with the care its merit deserves, that his conception of the great Pacific city of the future, seated on the Straits of Carquinez, has better foundation in sober fact and just inference than many a prediction which finds acceptance on a much slenderer basis of reason.

MR. COOKE AND THE CODLING MOTH.

There is no more interesting exhibition in the State Fair this year than that which Mr. Cooke has furnished in the lower hall, under the auspices of the State Agricultural Society. Mr. Cooke is neither an agriculturist nor a scientific man, yet he has developed into a self-made naturalist, and he has already been enabled to confer great and permanent benefit upon the fruit-growers of California. His business is to manufacture boxes of all kinds. In the course of his business he made many boxes for fruit-growers, and so he came to know that the ravages of some little insect were seriously injuring the orchards. By degrees he became interested in finding out what sort of an insect it was, and how it conducted its operations, and so he was led into a series of experiments which eventually put him in possession of the entire history of the codling moth. Having learned all about this foe of the orchards, Mr. Cooke was naturally led on to attempt remedies for the evil, and having tried all kinds of mixtures, he finally discoverd one which destroys the mischievous insect effectually. All this labor and all this research grew almost insensibly out of small beginnings, but now Mr. Cooke knows more about the codling moth than any man in California; and, moreover, his interest has widened so as to take in the scale insect, the phylloxera, and various other pests of the field, orchard, and vineyard; the same patient investigation and intelligent reflection which have enabled him to conquer the codling moth will, we trust, also give him the victory over his new adversaries. It is by such unselfish and persistent inquiry and experiment that the most important discoveries are often made, and such self-taught naturalists as Mr. Cooke have frequently conferred more benefits upon their generation than more fully equipped scientists. The State Agricultural Society cannot do better than to encourage and reward such services as Mr. Cooke has rendered and is rendering the State. It is thus that the society can effect the highest good of which such associations are capable. We hope, too, that our practical agriculturists will not leave Sacramento until they have fully examined the very interesting exhibit referred to, if only that they may see how much can be done, in every line of life, by patient observation and the resolute searching out of the actual causes of whatever evils are in operation.

THE DEBRIS EXHIBIT AT THE FAIR.

One of the most interesting exhibits at the Pavilion this year is to be found in the lower hall. It consists of specimens of the deposits which have been cast upon the Bear River lands from the mines above, and it constitutes the most striking and convincing proof of the blighting effects of this debris that could be imagined. On one side is a solid mass of the deposit or "slickens," as it was dug up. It is a closely compacted cake of deposit, so fine that when the moisture has evaporated it forms an almost rock-like layer, and in no long period does actually harden into a kind of sandstone. It is so close of texture that nothing will grow in it, even the hardy willow perishing in a short time. Next to this is a fine, sharp, white sand, which it has been claimed rather improves than injures the soil upon which it is deposited. The actual effect of this sand upon the productive capacity of the soil is shown in the exhibit. There is a box of virgin soil, fine, rich, black alluvial deposit, which produced this year eighty-one bushels of barley to the acre. By its side is another box taken from a field which has been covered by the sand. This field was also sown to barley, and produced no more than five bushels to the acre. That is the enriching effect of debris upon virgin soil. If the samples of the results of hydraulic mining upon farming land were sent all through the State, and explained by one of the Bear River farmers whose land has been destroyed, we think the opposition to the drainage bill which has been developed in the San Joaquin Valley and the southern counties, would be abandoned. Certainly this or something like it ought to be done, and that without delay; and we do not believe that it would be possible to find testimony so convincing as these few boxes of soil and lumps of "slickens" constitute.

THE FUTURE OF TRANSPORTATION AND PRODUCTION IN CALIFORNIA.

We hope that the farmers and business men of California will all read the recently delivered annual address of the President of the State Board of Agriculture, for it contains matter which concerns them deeply. There cannot be any question so important to producers as that of the method by which the staples they deal in are to find their way to a market, and are to secure living prices when there. These are the final problems of human exertion, in fact, and therefore when it is stated that Mr. Larue in his address forecasts a radical and most advantageous change in the lines and modes of transportation, the interest farmers have in his speculations and discussions becomes apparent. And what Mr. Larue has said in this address is not indeed news. To all who had capacity for reflection, the progress of the Southern Pacific Railroad years ago indicated the certain approach in the near future of a very momentous change in the relations of the transporter and the producer. The latter has, in this State, slowly struggled out of a condition of vassalage. The middleman antedated agriculture, and while it was young he absorbed its profits. For many years the distance to market, the difficulty of ascertaining Liverpool quotations, the clannishness of brokers, the servility of merchants, combined to deprive the farmer of the cream of his industry. He was allowed to live, but he was not allowed to flourish. But in spite of all these drawbacks the agricultural area broadened every year, and presently the control of the crop became too great an undertaking, even for such bold operators as Friedlander. The decline of the middleman and the rise of the Grange were coincident, but while the middleman has not disappeared altogether, neither has the Grange yet succeeded in doing the full work for which it was invented. All this time outside agencies, however, have been at work to change and ameliorate the situation. It was long since apparent that even if the middleman should vanish utterly, and no obstacles any longer exist between the producer and the merchant, the former would still be handicapped by the great distance, both in space and time, which separated his staple from the market. This, of course, affected the merchant also, and one of its consequences was to introduce an element of gambling into most transactions in wheat.

The disadvantages growing out of the long voyage round Cape Horn in fact appeared to be inseparable from the situation, and they threatened to increase so much that many thoughtful men began to predict the necessity of changing the staple, or at least of diminishing its produce for the future. All this time the Southern Pacific Railroad was eating its way through the desert and making straight for tide-water on the Gulf of Mexico. At last the attention of others than the builders of the road was drawn to it, and men began to inquire what new phenomena this second transcontinental road indicated. And now the time seems to have come when the producers may realize the full significance of this route, and may recognize the changes which it must bring to them. It may be well before going further to deprecate expressions of local jealousy, alarm, or displeasure, in this connection, and to point out that enterprises of the magnitude of the Southern Pacific are not merely justified, but necessitated by geographical and other equally permanent and commanding considerations, of a kind to which simply local interests must be subordinate in the very nature of things. It was evident that California was specially fitted to be one of the principal granaries of the world. That fact having been demonstrated it became the logical duty, alike of the highest business sagacity and the broadest public spirit, to solve the problem of connection with the world's markets. The prosperity of California's present and future population was involved in this. That she was to be a great wheat-growing State was already certain, but it was not so certain that her producers were to reap the legitimate profit of their toil. It was to determine this problem that the Southern Pacific Railroad was built, and it is now evident that it will more than fulfill the anticipations of its projectors.

Mr. Larue in his address showed that at the present time the aggregate freight charged on wheat to Liverpool is sixten dollars and fifty cents per ton, and that this is divided into a land transportation charge of three dollars and fifty cents per ton, and an ocean freight of thirteen dollars per ton. He estimated that when the Southern Pacific was completed the land charge would be the greatest, and the ocean freight from New Orleans to Liverpool would not exceed five dollars per ton. Supposing that the aggregate freight charge to Liverpool remained the same as now, though differently apportioned, the gain of the producer would be very great, for he would then reach his market in three weeks, instead of four months. The farmer could afford to pay a higher freight than he is now paying, for this immense gain of time, but he is assured against any increase of freight charges by the insurmountable guarantee of ocean competition. The railroad must transport his wheat for him at a fair rate, since he can always defeat any attempt at exorbitant rates by taking the long sea route. But in effect, we know that all railroads find it to their interest to encourage the extension of productive areas by transporting at the lowest paying rates, and therefore we may be certain that the Southern Pacific, and the ocean lines with which it connects at New Orleans, will carry the wheat of our farmers below the present figures. We believe that Mr. Larue's estimate of the ocean freight from New Orleans to Liverpool is too high, moreover. The enormous volume of freight requiring transportation every year will not only justify, but command a much lower rate than five dollars per ton. The situation, therefore, is full of hope for the producer. Even if the freight rates to Liverpool should remain nominally the same, the immense gain in time must amount to a practical radical lowering of them; and as a matter of fact, the actual diminution even of the nominal rates is a certainty under the new dispensation.

That the Southern Pacific Railroad will carry the entire wheat crop of this State, almost immediately after its completion, must now be accepted as a certainty. That this staple alone will give the road a freightage of at least fifty thousand tons per month is not less certain; and that one fact settles the question of the profitableness of the undertaking. Thenceforward our farmers will be practically independent. They will be able to take prompt advantage of every rise in the quotations. They will be able to put their wheat on the market precisely when it will fetch the best price. They will no longer be embarrassed and impoverished by a four months' voyage, during which all their calculations must be clouded, or to avoid which they must sell at a sacrifice. It is of course apparent that this important change in the transportation lines must stimulate wheat growing. It will very probably cause President Larue's prediction of a hundred million bushels of production to be borne out. For it must give to California wheat growers an assurance which they have never before possessed, and this it does by bringing them ten thousand miles nearer to their market.

The effect of the completion of the Southern Pacific Railroad upon California business and productions generally will be of the most important character. It is quite probable that the existing grooves of trade and commerce may be seriously affected, and it is beyond doubt that it will become necessary to readjust many long established interests. These necessities, however, must be faced manfully, since it is perfectly clear that they are unavoidable. There is no possibility of hindering or preventing enterprises which bring great benefits to large areas. To exclaim against the Southern Pacific Railroad would be as unreasonable and futile as to exclaim against the Suez Canal, though the latter has brought stagnation and decay to many a port and city which flourished vigorously before its construction. The Southern Pacific annihilates ten thousand miles of space, and therefore it is necessary to this coast and State. It solves the greatest problem before the producers of California, and therefore its completion will be a great public boon and benefit. It will save millions every year to our farmers, and retain in their pockets what has heretofore been paid to middlemen or been spent in overcoming the drawback of great distance from market. Nothing of so much importance to the agriculture of this State as the building of this road could possibly have occurred, and if the farmers have the sagacity and enterprise to combine and build their own warehouses, they will be in a position to secure the greatest advantages from the coming change. And if it is suggested that a route which serves to conduct California products to tide-water at the Gulf with so much facility, must serve equally well to convey imports from abroad to California, we reply that this also is doubtless among the consequences which the new route will produce.

With the effects upon other routes of transportation we of course have nothing to do, nor could these effects, whatever they may be, be in any way modified or altered by discussion. Superiority in the location of a transportation route is as supreme and insurmountable an advantage as is conceivable, and the only course to take when such superiority is manifested is to recognize and conform to it. The Southern Pacific has this advantage in alignment and grade over any other road, and until it is deprived of its advantages by the discovery or construction of a still shorter and cheaper route, it must maintain its ascendancy. As these changes are not conjectural, but certain, and as they will take effect within a comparatively short time, our producers and business men will do well to familiarize themselves with the approaching innovations, and especially to make ready to avail themselves of the benefits which will accrue from this great improvement in the means of transportation.

CALIFORNIA RAISINS.

A PAPER READ BY W. B. WEST, OF STOCKTON, BEFORE THE VINICULTURISTS OF THE STATE, IN SACRAMENTO, DURING THE STATE FAIR.

Only a few years ago it was impossible to find any California raisins that were worthy of the name. We were groping in the dark; we knew nothing of the varieties to plant, how to cure them, or how to pack them. We knew nothing of the localities suited to the raisin grape, and we had extravagant notions of the profits of the business.

All this has passed. We begin to understand the requirements of the business, and there were produced in this State in the year of eighteen hundred and seventy-nine at least seventy-five thousand boxes of good marketable raisins. We have also learned that to succeed we must have knowledge, patience, energy, and brains; that we must have the right kind of soil and climate for the true raisin grape; the Muscatelle will not succeed everywhere, even in California.

Many who rushed into the making of raisins a few years ago, found that there was too much to learn, and gave it up after making a few tons of trash from all kinds of grapes, dried and packed in a slovenly manner. A few indomitable persons stuck to it; they had hard times; the price of foreign fruit was low; they had much to learn; but they persevered and are now nobly rewarded. They have taught us that only in certain localities can the business be carried on profitably. We are gaining information by these experiments every day, so that the future of raisin culture is more certain.

The California process will be given in the report of the Commissioner of this district, R. B. Blowers, who is amply able to do it justice, as he is one of the most successful producers in the State. To those who possess the required skill and capital, the method of drying by artificial heat is of much value. But I believe in the future this business is destined to be carried on by small farmers. It is preëminently a matter of detail. It is such a business as will give employment to the family of the poor man; the one to make the little homestead in the hills a source of revenue.

To these the Spanish method is well adapted. I propose, therefore, in this paper, to give their methods of cultivation and preparation for market. From a people who have cultivated the grape and made raisins for many generations, we can certainly learn something, especially as we are only beginners.

The raisin district of Malaga extends about seventy-five miles along the coast and six inland. In this little strip of territory are produced all the Muscatelle raisins of Europe, amounting at present to over three million boxes per year. Not near all the land is devoted to raisins. Much of it is hilly and too dry and barren to produce anything. Some of it, like the Vega of Malaga, is planted with sugarcane. Oranges, lemons, and bananas are grown on the terraced sides of the ravines, where irrigation can be commanded. The olive, fig, almond, caroba, and prickly pear occupy some portion of almost every plantation. Many places are still unoccupied, the people seeming to want the enterprise or money to develop them.

In order to fully understand the matter, let us honestly compare our products with those of Malaga and see if we have anything to learn. Our newspaper writers sometimes tell us that our raisins are at any rate equal, if not superior, to those of Malaga. What are the facts? Our merchants (men of figures) tell us that our best brands are almost, but not quite, equal to London Layers.

The following was the relative price of fruit at Malaga in August of eighteen hundred and seventy-eight. It is the first cost in store—that is, the price paid to the producer, who only furnishes the fruit, the boxes and common paper, which has to be changed by the merchant.

There are five qualities better than London Layers, known at Nos. 1, 2, 3, 4, and 5. No. 1 rates at $4 50 per box; No. 2 at $3 75 per box; No. 3 at $3 25 per box; No. 4 at $2 50 per box; No. 5 at $1 75 per box; London Layers, $1 25 per box; Loose Muscatelles, $1 10; Layers, $1 00. The year eighteen hundred and seventy-eight was a year of unusual depression, the prices being at the lowest ebb.

The proportion of fruit better than London Layers varies at different vineyards, so that I cannot give the estimate exactly, but in one instance, where the party was said to be skillful, and with honest packers, it was given as one fifth. Thus, you see, that one fifth of their fruit was better than any of ours, and that ours could be ranked as only sixth in quality there.

It is a fact that their fruit as it is put on the market is better than ours. The reason for this will be explained in due time. In the Spanish methods of planting and cultivation we have nothing to learn. The cost of labor in this country entirely shuts us out, if we were disposed to follow them. I will only state that all planting and cultivation is done by hand. For planting, large holes are dug, often three feet square and two or three feet deep. The whole vineyard is dug over twice a year with hoes, which cultivate it very thoroughly. The pruning also is very close, usually leaving only one eye. To this thorough cultivation and short pruning I attribute the high quality of the raisins. The average yield of their vineyards is quite small. At one place, where the raisins were very fine, the yield was only two pounds per vine. As there were one thousand vines per acre the yield was only one ton; still it was called a profitable and valuable place. The yield on some hillside vineyards is even less than this, while on some valley land the vines will yield from five to ten pounds each.

In their mode of curing we may find something of advantage to us. As our grapes ripen nearly a month later than theirs we have trouble to get them dried, and have resorted to many expensive methods to accomplish this purpose.

Now, the climate in which the Spaniard cures his raisins in fifteen days is not any warmer than ours. It is a little more moist and somewhat varied by a shower; but his fruit being securely covered by boards remains perfectly safe, and by being covered at night to protect it from the dew, he is enabled to cure his raisins in the time stated, while we in California, who cure them on boards or canvas, are usually twice as long. I would, therefore, call your attention particularly to their drying floors, which will be described.

Their grapes commence to ripen by the first of August, and are usually gathered by the fifteenth of that month. They are not all picked at the same time, but only those that are perfectly ripe. Much judgment is required in this matter, as unless the grapes are perfectly ripe they will not make good raisins. They are picked from the vines very carefully, taking care to handle them by the stems, and are placed upon willow trays and carried to the drying-floors. In every subsequent operation care is taken not to disturb the bloom, which is very important to the higher grades.

We will now describe the drying floors, which are constructed as follows: Where the country is a little hilly, as it usually is, advantage is taken by some slope with a southwestern aspect. When this is not obtainable, an artificial slope is sometimes made by building a strong wall for the back and sides and filling in with dirt. Sometimes they are perfectly level. They like to have them with such an inclination as will allow the water to run freely from the covers. The length of these floors, which depends upon the inclination of the land, is usually about forty-five feet, where the angle is about forty-five degrees. Where it is steeper, they can be longer. The width is fourteen feet. Between each bed is a path of three or more feet. Around the outside of these beds is a row of tile to prevent the water from entering from the paths. These are properly cemented, as it is very important that no water should enter. In the middle is a row of tile to support the center of the covering, which is of boards fourteen feet long by one foot wide. They are laid across the bed, and are lapped one over another, so that no rain can get in.

The bottom upon which the grapes are placed, is of the natural soil, and is always loose and dusty, the vinyardists contending that the dust rather protects, than disturbs, the bloom. The grapes are placed quite closely upon this floor, but not so as to cover each other. Every one who has grown grapes knows that there is on one side of a bunch of grapes that shows the stem more than the other. This side should be placed upwards.

The covers should not be placed on at night, until the grapes have shriveled a little or in three or four days. At the end of eight days, if the weather is good they will require to be looked over, to take out such grapes as have dried in advance of the others, and these are clipped out with a pair of scissors. If allowed to remain they would become hard and worthless. A man commences at one end of the bed and selects those that are dry or nearly so, placing the remainder back just as they were before, not turning them over as is the universal practice here. The reason for this is that the side cured on the ground, presents a more attractive appearance than the other.

At the end of the next seven days the raisins are fully cured. Here let me state that no substance has ever been found that will cure a raisin so well as the ground, and no plan have I ever seen that seemed to me to be more fitted to accomplish the object sought than the Spanish sidehill drying floors.

Those made upon level ground require a few days more to cure the fruit, and are sometimes covered with cloth or corrugated iron. The superiority of this method over the ordinary California way of using boards or canvas is so marked that I hope some of our vineyardists will give it a trial. The necessity of covering fruit at night is not properly recognized in this State. I have found fruit in Spain warm and dry in the morning, whereas it would require at least two hours sun to bring it to that state had it not been covered. The covers also protect them from any showers that might come up during the drying season. They are also useful in retarding the drying, as it sometimes occurs that the raisins cannot be packed as fast as they dry.

The assorting and packing comes next. The raisins are taken directly to the packing house, and assorted and packed immediately for market, not going through any sweat in process, which some of our people think necessary. This sorting is of such a complicated nature, and requires so much skill, that it would be utterly impossible for us to follow it. They calculate that it requires a day's labor to select and pack a box of the best raisins. Another good reason is that the American market demands but few of the higher grades of fruit. The London Layers and loose Muscatellas are the most sought. As a full description of their modes of packing would take much time to go into detail, and be of no practical advantage, I will pass them with a few remarks.

The fruit is, as I said before, taken immediately to the place for assorting. A skillful workman takes each bunch in succession and grades them according to their size and condition. When a bunch contains two or more grades, as they usually do, it is cut up so that each can be put in its proper place.

Each kind is carried to the workmen who are packing that particular class. Although the raisins never hold out to the weight they are supposed to represent, I noticed the workmen were careful to weigh each form as they were put into the box. They are packed in forms of six pounds each, using common paper, which is replaced in the warehouse by a more fancy article, at the option of the purchaser. The loose Muscatellas are those single berries which may be on a bunch of superior class, which their strict grading requires to be cut out; hence they are usually of a better size than their prices would seem to warrant.

I will mention some of the faults of our raisins. I do not take into consideration any of those products made from all kinds of grapes which are sometimes called raisins, but only those produced from the Muscatella. First, they are not evenly dried, some of them being cured too much, others not enough. This can be obviated by going over them at the proper time, as mentioned before; second, they are too small. Not enough attention is paid to pruning closely. They are not properly thinned when there is an overcrop. The practice of allowing a vine to produce fifty or sixty pounds is pernicious. Where the size of the berry is small, do not allow it to bear so much another year. The Spaniards take off much of their fruit. They even clip off a part of a bunch when they think it is too large. We had better have less berries than such small ones.

It is sometimes urged that we cannot afford to take the pains that the people of Europe do; that labor is too high. It is too high for many of their operations, but at the same time it never pays to work poorly. There is time wasted upon every farm which if properly applied would go far towards making up the difference between European labor and ours. Our land can be worked at less expense by using horses to plow instead of hand labor. Our crop can be gathered at small expense, because we can use the wagon in the place of the hand-basket; surely we ought to be able to give our vines the proper pruning and thinning they need. Nevertheless, when we look back and see what a marked improvement there has been in our raisin interest during the past four years, we do not feel like finding fault with our pioneer raisin growers. They, like all others who have been connected with the grape interests, have had much to contend with.

THE SEEDLESS OR CURRANT GRAPE.

There is another class of fruit that is destined to be very prominent in our products. I refer to the seedless varieties of grapes. At present they have not been largely planted, nor have they been, as a rule, a success. I will describe the different varieties, and endeavor to show why they are not more successfully grown in this State.

The true currant of commerce, known as the Zante currant, is a black variety, very productive, but has never been grown successfully except on the Ionian Islands of Zante and Cephalonia, and the southern coast of the Gulf of Corinth, from Patras to Corinth. On the northern side of this gulf, it is a partial or, generally a total failure, as it is also in other islands near. In this State it has never been tried with the same treatment that it receives in the Morea; that is, flooded in the Winter, and pruned long, but it has usually been pruned like the Mission grape, and grown in vineyards with other varieties. We have, therefore, no right to say it cannot be grown profitably. The man who can grow the Zante currant successfully has a fortune. The white variety of currant is quite common here, but it is too small and too poor a bearer to pay for cultivation. The Sultana is the most promising of all the seedless kinds. It is of good size, is productive, and finds a good market. It is bound to supersede the Muscatella in many branches of cookery. I find that the demand increases in a greater ratio than the supply, which is at present limited. It did not attract much attention until last year, and consequently has not been planted largely. When its good qualities are known, it will be planted extensively.

As the question of our ability to make raisins successfully has been fully answered by the amount and character of those put on the market last year, we will now consider the chances for a market.

I believe it is generally conceded that our products have quite shut out the foreign brands, except perhaps a few of the choicer grades. Our production more than equals the consumption; our vineyards are constantly increasing; the time has come when we have to seek other markets, where our fruit will come in direct competition with that of Malaga.

If we call our best raisins nearly equal to London Layers, our average would be about equal to Layers. The price of Malaga fruit has been very low since eighteen hundred and seventy-six, on account of the depression in business which naturally followed the close of the French and German war.

We quote, however, the price of Layers in the New York market: In 1875, $2 15 per box; in 1876, $1 90; in 1877, $1 60; in 1878, $1 85; in 1879, $1 65; in 1880, $2 25. It would be hardly right to estimate upon the average of the years, as some of them represent seasons of great depression. The vineyardists of Malaga complained greatly of the low price of their fruit, stating that the culture was not profitable; that a few years like eighteen hundred and seventy-seven and eighteen hundred and seventy-eight would bankrupt them. The phylloxera has commenced its ravages there, and as the vineyards are old and worn, most of them on the hillsides, we may soon expect to hear of a decrease of product and consequent rise of price. We may not be able to find a market in the Eastern and Middle States, as they are more exacting in quality, but in the Southern and Western States, and also in the Territories, our field is large.

I will not make any estimates upon the profits of the business. There are possibilities in the future beyond my foresight. Those who have made raisins know better what the cost of production is. The present railroad charges are one and a half cents per pound. I see no reason why they cannot be sold in the Chicago market with a profit to the producer.

In order to show the magnitude of the raisin business, I will give some statistics from official sources:

EXPORTS OF RAISINS FROM MALAGA TO THE UNITED STATES.

YEAR.	Boxes.	Barrels.	Sixty-pound Cases.	Value.
1869	1,343,005	25,552	20,134	----------------
1871	1,227,323	650	26,175	$2,829,486
1874	1,197,533	586	32,806	2,202,637

ENTERED FOR CONSUMPTION.

YEAR.	Pounds.	Value.
1876	32,221,065	$2,425,277
1877	32,419,637	2,109,334
1878	32,931,736	1,904,866

Duty 2½ cents per pound.

CURRANTS.

YEAR.	Pounds.	Value.
1876	20,911,061	$856,426
1877	17,152,664	749,488
1878	17,941,352	776,827

Duty 1 cent per pound.

TRANSACTIONS

OF THE

Golden Gate Agricultural and Mechanical Fair Association,

District No. 1,

COMPOSED OF THE COUNTIES OF ALAMEDA, CONTRA COSTA, AND SAN FRANCISCO.

1880.

OFFICERS OF THE ASSOCIATION.

President.

E. H. PARDEE .... Oakland, Alameda County.

Secretary.

L. WALKER .... Oakland, Alameda County.

Treasurer.

A. C. HENRY .... Oakland, Alameda County.

DIRECTORS.

A. C. DIETZ .... Oakland, Alameda County.
JOHN B. WATSON .... Oakland, Alameda County.
E. H. PARDEE .... Oakland, Alameda County.
C. H. CUSHING .... Oakland, Alameda County.
FRANCIS BLAKE .... Oakland, Alameda County.
D. F. MAJORS .... Concord, Contra Costa County.
W. E. MILLER .... Oakland, Alameda County.
W. E. HALE .... Oakland, Alameda County.

REPORT.

Rooms of the Golden Gate Agricultural and
Mechanical Fair Association,
Oakland, December 1, 1880.

To the honorable the State Board of Agriculture:

The Directors of the Golden Gate Agricultural and Mechanical Fair Association respectfully submit this, their report of the transactions of said Association, for the year ending this date.

L. WALKER,
Secretary.

OPENING ADDRESS,

Delivered by E. H. Pardee, President, at the Pavilion, September 14, 1880.

Members of the Golden Gate Agricultural and Mechanical District Fair Association:

Ladies and Gentlemen: I feel more than usually honored this evening in having the privilege and opportunity of appearing before the friends of this society for the third time, by the unanimous response and solicitation of our very able Board of Directors. Believing it to be a proper place of acknowledgment, I thank them for the continued confidence they have reposed in me. Since I last addressed the friends of this society, another year of days, weeks, and months have passed the milestone of time, and another year's stewardship of the society is looked for through their presiding officer, and with words of cheer and salutations, I congratulate the Board of Directors, I congratulate the friends of the society, I congratulate the people of Oakland, I congratulate the people of the district, and, lastly, I congratulate the people of the whole State, upon the auspicious future that will be brought into requisition by the operation of the new agricultural law, which divides the State into eleven agricultural and mechanical districts. It will do away with the universal animosity that has heretofore existed among District and County Fairs. It will cause to be held annually a district convention, whereby an exchange of ideas and mutual consultation, by representatives from all the districts, and a spirit of harmony and emulation prevail. A uniformity of purses and premiums will be agreed upon. In short, a system will be inaugurated; every Fair will be conducted as a member of the same family, and universal success and prosperity will attend our annual gatherings.

Notwithstanding the bill met with determined opposition in the Assembly, I believe that time will develop the wisdom of the measure to that extent that even its enemies will become its devoted friends and warm supporters.

At the close of the first Fair the society found an indebtedness, of which the management, individually and collectively, was responsible for, to the amount of twelve thousand dollars. Notwithstanding the hard times during the second exhibition, and the unfortunate occurrence of the excitement of a heated political contest, the gubernatorial election during Fair time, which prevented thousands from attending our exhibitions, the Board of Directors, through their zeal and indefatigable industry and financial ability, had succeeded in reducing the debt to six thousand dollars. And I think it safe to say that if the friends of the society, the friends of a popular and spirited enterprise, will give the Board the encouragement that its merits demand, the germ of the most popular enterprise has been in the rich and fertile soil of one of the most enterprising districts of the State, and its fruits will be gathered by the sons of toil for generations to come.

With the people, more than with the management of these beneficiary institutions, depends the perpetuity of their existence, and with them, in a great measure, rests the changes of this society for better or for worse. I will hail with delight the time when this society can say that no debt obscures the light that should illuminate the path of the Directors in this noble enterprise. Then you will see a pavilion in this city that will vie with those of older, but not more enterprising States; then you will see an edifice that will be broad enough to invite the combined industries of the whole State; then you will see a temple for art where the combined genius of the world will enter her threshold for exhibition and competition.

What California now wants more than anything else, to secure to us universal prosperity, is that degree of governmental encouragement as will induce judicious and careful investigation and experiment with new and valuable products. And the legislator who seeks to do this honestly and judiciously, will inscribe himself on the hearts of the masses of the people, and will be recorded by the historian a benefactor of his race.

The old fossil will say: "Don't experiment with the people's money." I say the progress of the age demands it, because the fertility and usefulness of California's soil is not developed to that high standard that the laws of art and science require.

To Jefferson belongs exclusively and forever the high renown of having framed the glorious charter of American liberty. That was an experiment. To his memory the benediction of this and all succeeding times are due for reducing the theory of freedom to its simplest elements, and in a few lucid and unanswerable propositions establishing a groundwork on which men may securely raise a lasting superstructure of national greatness and prosperity. But our fathers, in the august assemblage of '76, were prompt to acknowledge and adopt the solemn and momentous principles he asserted. With scarce an alteration—with none that affected the spirit and character of that immortal instrument, and with but few that changed in the slightest degree its verbal construction—they published that exposition of human rights to the world as their declaration of American independence, pledging to each other their lives, their fortunes, and their sacred honor, in support of the truths it proclaims. This was the grandest, the most important experiment ever undertaken in the history of man. But they that entered upon it were not afraid of new experiments, if founded on immutable principles of right, and approved by the sober conviction of reason. There were not wanting then—there are not wanting now—pale counselors to fear, who would have withheld them from the course they were pursuing, because it tended in a direction hitherto untried. But they were not to be directed by the shadowy doubts and timid suggestions of craven spirits, content to be lashed forever round the same circle of miserable expedients, perpetually trying anew the exploded shifts which had always proved lamentably inadequate before.

To such men the very name of experiment is a sound of terror. It is a spell which conjures up gorgeous hydras, chimeras dire.

They seem to know all that is valuable in life—that the acquisitions of learning, the discoveries of science, and the refinements of art—are the results of experiment. It was experiment that bestowed on Cadmus those keys of knowledge with which he unlocked the treasure houses of the immortal mind. It was experiment that taught Bacon the fertility of the Grecian philosophy, and led him to that heaven-scaling method of investigation and analysis on which science has safely climbed to that proud eminence where she now sits, dispensing her blessings on mankind. It was experiment that lifted Newton above the clouds and darkness of this visible and diurnal sphere, enabling him to explore the sublime mechanism of the stars, and weigh the planets in the palm of his hand. It was experiment that nerved the hand of Franklin to snatch the thunderbolt from the armory of heaven, and decoy the lightning into an old-fashioned whisky bottle, and shut the door and tame it so that it was at the command of science. It was experiment that gave this hemisphere to the world. It was experiment that gave these United States to freedom.

And it will be experiment that will bring twenty million acres of land in California, now considered worthless, under a high state of cultivation, which will give one hundred and sixty acres to each one hundred and twenty-five thousand honest farmers, who are now houseless and landless, and manifesting signs of discontent because of the wolf smelling around their doors, and the cries of their children, at the setting of the sun and his first coming in the morning. I say with a few hundred thousand dollars judiciously expended, vast areas of land can be made happy homes for the landless and the poor. And nothing in my opinion will ever consummate this laudable enterprise, save the constant agitation of appeals for the poor man through our system of District Fairs. In order to accomplish this there must be a concert of action. And how else can you devise it only through our State and District Fairs?

I recognize the sovereignty of man capable of accomplishing great results. The dominion is a noble, it is a vast, it is a varied one. Here in this pavilion are proofs of man's sovereignty over mind and over matter, over light and over heat, over chemic and over mechanic energies.

From the marching of the season and the timely rains, from the hidden wealth of the mountains, and from wealth more real, of the generous soil; from the products of the forests, and of the flock and the field, and from the products of the far resounding sea, man derives revenues and service. Lightning is his courier, and light his artist. Trade-winds move his light-winged argosies, and snows gather on Sierra crests to swell the floods wherewith his ample acres shall be irrigated.

Flowers, by their weird alchemy, transmute dew and gases into aromatic odors for his delight, and change sunbeams and clays into hues emerald, purple, and roseate, wherewith to greet his kindling glance, as he moves out to gaze upon the inheritance over which "far as the breeze can bear the billow's foam," one day shall be true: man's nod is empire and his foot-fall law.

Silkworms spin for him, oysters secrete pearls for him, lime becomes marble and carbon diamonds for him; rocks are turned into silver, and plants become coal for him; rivers leap to light from lofty fountains in the hearts of heavy hills, that utilize the law of gravitation. Man may make them turn his ponderous wheels, and whirl the myriad spindles. The wild fowl "nurses" the plume that shall wave upon the victor's helmet; and the cotton and the flax plants offer the fibres of which the banners, beneath whose folds he shall move forth to conquest, or repose unharmed amid the fruits of his free and honest industry.

Force guards him, sows, reaps, thrashes, and grinds for him, as in ages past it toiled in fashioning his dwelling place.

Art breaths inspiration; music reveals her mystic laws to his modulating genius.

The block becomes a thing of beauty. The canvas glows with the tints and flush of life. Arch and pillar, capital and dome, spring from earth and soar to heaven, almost obedient to the necromatic touch.

Homer wrapped in his singing robe, wet with the dews of the morning of the ages, chants his immortal epic to find in the broadening centuries a whispering gallery, round which his melodies shall swell in musical thunder.

Dante, gentle as he is sublime, tender as he is stern, a violet in the rift of an Alpine glacier, or the "Victoria Regia" of the Middle Ages; and Milton, blind with the excess of light, laden with the lore of classics and of sacred thinkers, clarified by waters of sorrow and chastened by fires of fierce scorn, his harp upon his shoulder, daring the seraphim to a trial of his strength of passion, and their sweep of thought—these all proclaim the extent and opulence of the sovereignty of man—all are his, the true, the beautiful, and the good.

And, as we look over the grand display in this pavilion, the artistic arrangement of the exhibits, it only shows the cunning of the hand, and the vigor and force of the human intellect, and the sovereignty of man.

But, my friends, I ask you to go with me and unfold the pages of history, and see what we can find in the morning of Creation. There, in the good old Book, is a plain record, where our old grandfather, Cain, appears as "a tiller of the ground," and Abel as a feeder, or "keeper of sheep," offering the firstlings of his flocks. Here we find the two grand divisions of agriculture—the tilling of the soil, requiring the active labor of head and hand, and the raising of animals; and it is reasonable to believe that these two divisions continued, as the human family increased, from the death of Adam to the birth of Director farmer Dietz.

And as we have traced agriculture from its infancy to manhood, the art and handiwork of man through his mechanical ingenuity, all subject to the sovereignty of man, and his works were exemplified in this small temple of industry, I now invite you to go to the Oakland Park, and see what the Chairman of the Park Committee, the shepherd of the hippodrome, will offer to the friends of the society—the "firstlings of the flocks." Go to-morrow, and go every day, until the close of the Fair, for he will offer you such an annual treat that it will take you a full week to take it all in.

He has on parade, every morning, from 10 A. M. to 12 M., the finest cavalcade of stock ever congregated on the Pacific Coast. Only think: more than two hundred head taken from the finest herds from Shasta of the north, to San Diego of the south, with as many fine head of horses, all marching in double file around the track, to the melodious notes from Wolcott's Band of "Auld Lang Syne." It is good for the soul to go and look at these fat and happy families of the brute creation.

I will now thank the Board of Directors for their indefatigable zeal and exertions in bringing together such a diversity of matter, which makes this temple of art look like a thing of beauty and life. I thank them for the uniform courtesy always extended to me; an approving smile, which is daguerreotyped on my heart, and will remain until time is no more. I thank the exhibitors for the grand display they have given us; and lastly, I thank the friends of the society for their presence and patronage, and ask them to give the society their annual support; and God will bless you all, is the prayer of yours truly.

ANNUAL ADDRESS,

Delivered by Governor George C. Perkins, at the Pavilion in Oakland, Wednesday Evening, September 15, 1880.

Mr. President, Ladies and Gentlemen: I esteem it a great privilege that your kind invitation gives me the opportunity of meeting you face to face, and expressing in a plain way some thoughts, which seem to me to be so important that they ought to be kept constantly in view by the people of this State, and especially by the farmers of our commonwealth. As I am rather a practical sailor than an experienced farmer, I presume you do not expect me to speak particularly of topics relating to the management of the farm, or to present anything new in agricultural chemistry; but being temporarily the political representative of the people, it may not be amiss to give you an expression of my views from that standpoint. It requires no great sagacity to perceive that the most important physical element of a State is its soil—the land within its jurisdiction. Without that there could be no people and no State. It is, therefore, the very basis of the superstructure. Its limits are the boundaries of the State or Nation; upon it are created the homes, about which cling the tender recollections of childhood; and those homes give inspiration to the spirit of patriotism that defends the State in the hour of peril. Hence the soil, and those who cultivate it, are most intimately connected with the life and growth of a Nation.

Dr. Draper, in his work on the "Intellectual Development of Europe," which is justly held in high esteem, after an able and searching review of the facts of history, announces the conclusion that, "Nations, like individuals, are born, proceed through a predestined growth, and die." "Man," he says, "is truly the archetype of society; his development is the model of social progress." Whether this theory be true or not, in a literal sense, there is doubtless enough of truth in it to justify the deduction which the learned author referred to draws from it, namely, that "all political institutions, imperceptibly or visibly, spontaneously or purposely, should tend to the improvement and organization of national intellect." If there is error in this deduction, it is perhaps in the fact that too much stress is laid upon the importance of cultivating the intellect as a product of civilization; and not enough upon the importance of culture in other directions, particularly in that of morals and patriotism. It is not my purpose, however, to enter into a criticism of that kind, nor to indulge in any disquisition concerning the elements of civilization, further than to supplement the opinion already quoted with that of Mr. Buckle, that the chief cause of civilization are soil and climate.

The former, in ancient times, and especially in Asia and Africa, exercised the most influence in consequence of the quick and abundant returns it gave, but the latter, climate, through its genial effect upon the energy of man in stimulating him to labor, has given to Europe and America a civilization that is much more effective, showing a capacity for development in all directions that was quite unknown to the old civilization, originated by the fertility of the soil. Even among ancient civilization, however, there was this remarkable difference: that the developments under a friendly climate were of a better and higher type than those due to the fruitfulness of the soil. The civilization of Egypt, for example, was the result, chiefly, of a fertile soil, caused by the annual overflow of the Nile, and though in its nature great, was not lasting or specially influential; while that of Greece, where the soil was poor, was due mainly to a genial climate which brought into activity all the energies of the people, and this promoted a growth of intellect unknown before, and in some respects still unsurpassed, having through its literature and its arts left an imperishable impress upon the character and civilization of the whole world.

It seems, then, that climate and soil, operating upon individual character, are the chief agents in the promotion of intellectual growth among nations. If this be true, it must follow that where the climate is favorable and the soil is good, both causes will coöperate in developing the highest type of civilization; and as intelligence promotes longevity in the individual man (who is the archetype of society), such a civilization ought to insure long life to the nation in which it prevails. We, who believe in our republican form of government, as founded upon sound and imperishable principles, cling to the faith that it is not destined to "perish from the earth," and as the vast area over which the nation extends is universally favored in both climate and soil, it is not unreasonable that we should hold this belief, providing we do not lose sight of the conditions upon which long life for the nation depends, that is: the cultivation and organization of a national intellect capable of supporting the body politic so intimately dependent upon it. As we wish our posterity to enjoy as much of the happiness of life as possible; and as we believe our political institutions are peculiarly adapted to promote happiness; so we are all interested in whatever may tend to save our country from premature decay. And in this far more depends upon individual effort—upon the unremitting effort of all the people, in their individual capacity—than upon what may be done by us as a government. Indeed, the latter is but the effect of the former, as a cause. The national intellect of which Dr. Draper speaks, is but another name for the public opinion which is well recognized as the controlling force in our system of government. Public opinion is the aggregate judgment of the people. It is expressed in various ways, but most effectively at the ballot box. There it forms the government, creating Legislatures by which laws are made; naming Judges by whom the laws are interpreted; and selecting executive officers through whom the laws are enforced. Thus it happens that popular ideas in time become crystallized into law, and unpopular laws either fail of enforcement or lose the character of law by repealing statutes.

How, then, can we best create and maintain a sound public opinion? That is the problem which must always be before the people of our country. It should never be lost sight of, neither by the Government, nor by the people individually. Upon its solution depends the destiny, the very existence of our free institutions. If asked how long we may expect the nation to live, the answer is plain: so long as the virtue and intelligence of the people maintain a public opinion strong enough to hold the Government true to the principles upon which it is founded. If, unfortunately, the pressure of our rapidly increasing population should ever check the intellectual and moral growth of our people, as it has in some other countries, then would come the pause indicating the approach of old age and declining years. And if that pause should be followed by internecine wars, as it naturally would be, the end would not be far off.

Civil liberty may be likened to the pure mountain stream fed by stainless snows. The mild heat of Summer pressing gently upon the source causes the supply to be continuous and abundant. The natural storms of Winter replenish the melting snows; and so the limpid waters run unceasingly to the seas. But let the volcano burst forth with its raging fires and floods of lava. Then the stream will no longer be a fountain of life, but polluted and poisoned; it will become a source of death, or cease to exist altogether. So in a popular government. Public opinion, from which the fountain of liberty flows, is renewed by the discussion of political questions, as in our frequently recurring elections. They are a part of the means whereby the public conscience and intellect are educated; they are the natural medium through which the will of the people is formed and expressed. But when such contests cease to be a friendly and honest struggle for principle, when they degenerate into a fierce and angry fight for the spoils of office, the results are demoralization, and a tendency to ultimate decay. In the passions of the evil born, men are apt to forget their higher duty to country and to posterity, sacrificing all to secure a temporary party triumph. Here is a dangerous spot in our system; and it is mainly to the men of the country that we must always look for the conservatism that will check the heated passions awakened in the populous cities; they have more space to work in, more time for reflection, and being more generally identified with the soil, they are not so apt to desire change merely for the sake of change.

In this way they become the sheet anchor of the commonwealth. They may hinder progress somewhat; they may go a little too slow possibly; but we will always have the power of keeping close to that which has been tried and found good to fundamental principles. If they do not accomplish so much in creating a sound public opinion, they will do more in maintaining it. But it is in your power to do a great deal towards creating public opinion. You may not all be able to write book or newspaper articles, or make speeches, but each one of you has the home training of one or more of the future citizens of the republic. Perhaps some of you are training future Presidents. It is certain you are educating the men and women who are to rule the country generations hence. That which they learn at schools and universities is not more important, if indeed it is as important, as the things you can teach them at home. Their moral training will be almost wholly under your control, and while the schools are stimulating the intellects, home life is the source mainly from which they will imbibe their notions of right and wrong. You all remember how scrupulous your fathers were in their conduct towards their neighbors, how prompt to acknowledge every act of kindness, how ready to lend assistance to others when in their power, how particular in returning money or any other article borrowed, how attentive to their duties as neighbors in cases of sickness or death or want, how earnest and yet how tolerant in religious faith and duty, how gallant and respectful towards all the weaker sex, how fervent in their love of country, how they admired genuine worth in public men, and despised the arts of the demagogue; in short, how true and noble they were in all the relations of life. So upright was their conduct that their faults seemed but the exceptions to prove the general rule. Who of you does not remember the father or the grandfather, with a nature and a courage so strong that he dare face any foe in the most deadly strife; and yet so tender that he could not listen with dry eyes to a simple story of human suffering! Such were your fathers—the fathers of our country from whom you learned the duties of life. And let us not forget their wives—our mothers. How plain and simple their ways of life. The old farmhouse by the spring or well, with its long gable roof, and the neat fence around it, nestled among the trees or flowers—that was the sacred spot on earth to them. Everything about it, on it, or in it, received their most attentive and affectionate care. Up with the sun in the morning, with their own hands they prepared our frugal breakfast, while we were milking the cows, chopping the wood, or feeding the horses, hogs, poultry, or cattle. Each member of the household had his duty to perform. There were no idle hands under their control. They were firm believers in the truth of the couplet that—

"Satan finds some mischief still
For idle hands to do."

And to us boys who had our ideas of fun, they seemed as if they were afraid Satan did not know the difference between mere idleness and a jolly good play. But when we got into trouble with some other boy, or failed to get the prize at school after trying so hard; or fell out of the apple tree and sustained a severe injury; or broke through the ice while skating and narrowly escaped drowning; or fell in love with that dearest of all the girls; then it was a great comfort to have a mother to bind up our wounded limbs and give us advice in time of need. How tenderly she watched us as we grew up to manhood, and ventured upon the stormy pathway of life. With what gentle solicitude she slipped into our pocket the well worn testament, and bade a tearful "Good-by, my son, God bless you;" or it may have been with some of us that ere we reached the noonday of youth, hardly realizing what we were doing, we bade adieu to the old homestead, to seek, as we believed, a more favored land; but alas! we soon repented of our folly, and the only consolation left was to know that the prayers of a loving mother followed us wherever we went. Some of us have thought this when tossed upon the wide sea with but a single plank separating us from a watery grave. Many of you may have thought this as you stood upon the battle field, as your comrades fell around you, and your summons might then be borne by the angel of death to strike you next from the number remaining. Others of us have felt this unspeakable influence while delving in the mines, suffering, an exile from friends, and clad in a garb that seemed to cover nothing more tender than the cold rocks which surrounded us. May we not all recall those days, and the mothers and fathers of our youth, with profit as well as with pleasure? It was by those home influences that we as a people imbibed the better part of our nature.

It was that process which created within us conscience and intellect that give whatever of value there may be to our influence upon public opinion. And the same process is still going on, and will continue its operations. Let us hope it may never be less effective; whether it shall be or not is a question for us to determine. No doubt, every parent who has had occasion to feel great anxiety for his child, has at times asked himself whether he ever caused such anxiety to his parents; and if so, whether there can be such a thing as "paying for one's raising." The answer doubtless is, that so far as the present is concerned, no; but the pay is exacted by nature in the raising of our own children. We discharge the obligations to our fathers and mothers, in part at least, by doing our duty to our own offspring—and at the same time we discharge a duty to our country. Speaking of home life and its influence upon character, leads me to the suggestion that very much depends upon what that home is. The character of the child is so impressive, that scarcely anything with which it comes frequently in contact will fail to have some effect upon it. If the farm be conducted upon good business principles, everything in its place and a place for everything, will make the boy methodical through life; a time to do everything and everything done in time, will make him prompt by habit. A tidy house with flowers, shade trees and pleasant surroundings, will leave a happy recollection of home upon his mind, from which he will always derive pleasure and good inspirations. Too much attention to these details, which indicate culture, taste, and refinement can hardly be given. No occupation in the world is so independent, and none is more honorable, than that of the farmer. If any farmer does not feel this to be so, there is something wanting somewhere. He does not properly appreciate his calling, and that is evidence that he has made a mistake in selecting it. It is not to be expected that every farmer will be versed in the literature and art of agriculture, though it is a matter of regret that he cannot be; for it is now well demonstrated that the productive capacity of the soil may be greatly increased, sometimes more than double, by careful attention to the nature of the soil, by tilling it according to its nature, by raising from it the peculiar crops for which it is suited, and by observing the recognized rules relative to rotation of crops. It is in this way and by the various methods of renewing the soil that in old agricultural countries, good crops are obtained from old fields. Already in this State the soil in many places is suffering from inattention to the simplest principles of agricultural chemistry. Now, this is not a difficult science to learn ; it is not inconsistent with practical farming; on the contrary, it is in aid of it. The soil is easily analyzed. Its character and adaptability to every crop may thus (and also by experimenting some) be ascertained. The very effort in this direction will make the farmer's occupation more interesting, because it will make it more thoughtful. The more scientific we get in any business, the more intellectual we become, the more we do, as Draper expresses it, "for the improvement and organization of intellect."

Another way in which the home culture may be greatly promoted is by a careful attention to the literature that comes into the house. None but the best books, magazines, or newspapers ought ever to be admitted. Sometimes enterprising agents of trashy, flashy, sensational periodicals with attractive pictures, visit farmhouses and solicit subscriptions. They are generally offered very cheap, and kind-hearted fathers or mothers are apt to take them just to please the children. Usually such papers are filled with the most worthless stories, devoid of anything to stimulate the imagination to healthy activity, to excite a laudable ambition, or to improve the mind in any way. They not only do not improve, but they positively injure the reader, for they cultivate a vicious taste, and destroy the desire to read matter of more value. There is no excuse for such reading. The number of good books and periodicals is unlimited. Of the former, standard histories, and works of fiction and poetry, works upon social, political, or scientific subjects, are so numerous and well known as not to require mention. Of the latter there is an abundance, though it may require a little more care to select them.

The journal or journals selected should be above suspicion in their character. They should contain the latest news of the day, but should be edited with care, excluding all that is coarse and purely sensational or prurient. They should have political opinions and expressed views upon all questions bearing upon the prosperity of the State, for the newspaper that has not is a mere catchpenny affair. But it ought not to be so blindly partisan that it cannot be fair and impartial, especially in its news columns. The journalist who will purposely misrepresent a public speaker, or a fact of any kind of sufficient importance to be reported, is not worthy the name. He is not worthy of confidence in anything. In his editorial columns he is expected to express his own views, and there alone. The other portion of the paper he has entered into an implied contract with the public that it shall be devoted to their interest, and shall be a medium for a truthful history of the times. If he is not capable of giving such a history, either by partisan bias, prejudice, or personal malice, or want of ability, he has no business to be a journalist; for it is an occupation of great importance, carrying with it great influence upon society, and grave responsibilities. Through the press very much is done toward educating the people and causing them to form opinions upon the various subjects coming before them. Hence it is the first duty of the journalist to be honest with his readers, in reporting everything truthfully. No other journalist should ever be patronized by the farmer. Upon no one will such reading—even the editorials—have more effect than upon the boys and girls upon the farm.

In this connection I desire to urge that our farmers try to impress upon their sons the dignity of their occupation; that to be a good and successful farmer is quite as great a success in life as to be a successful lawyer, or doctor, or clergyman, or any other profession. The habit of preparing the brightest of the boys for one of the professions is a mistake. The professions are now greatly overrun. In all of our large cities there are hundreds of healthy, ambitious young men almost starving in their unavailing efforts to secure a foothold in some profession. Observation has shown us, that until a man has attained the age of thirty-five or forty years, he cannot, except in some cases, get enough business as a lawyer to support himself. Before that age he must serve as a clerk, or junior partner to other lawyers who receive all of the fees, unless he has the means to sustain himself, or he must drift into a practice which will be more apt to retard his progress than to advance it. Business men hesitate about trusting a young man with their important cases, when old practitioners are standing ready with their many years of experience to add to their learning. So with young physicians—it is a fearful struggle for them to get a standing in any large city. It is a wonder how many of them manage to live at all. It must be that many spend a small fortune in establishing a practice from which they obtain a meager subsistence by the most arduous labor, after having devoted years to qualify themselves for the profession. And as for clergymen, it is certainly no better, viewed from a financial standpoint. Their salaries are generally too slender for a lawyer's clerk to live upon; and even such pittance is most grudgingly paid. How much more satisfactory it is to draw a salary from the world's great paymaster—our nation's soil! Everything the farmer produces is so much added to the wealth of the community. The producer has the proud satisfaction of knowing that he has not wronged any man out of a farthing, nor wrung anything unwillingly from a fellow-being. He can truly "sit down under his own vine and fig tree, with none to molest him or make him afraid." Neither is there any better field among the merchants or the mechanics in the city. The occupation of the merchant is fraught with great anxiety and risk, while mechanics find only by close application and great diligence that they are able to support their families. But next to that of being a farmer, I would say to every young man, learn a trade; you have then a capital that can never be taken from you; and should adversity come, you can at any time commence again with that which the foreclosure of the mortgage upon the old homestead could not compel you to part with. I realize the fact that many young men, from their very nature, dislike farm life, and have a natural taste for some more exciting occupation. He may, by learning a trade, do as well or better in the city. But the great objection to this tendency to drift into the cities, is that the proportion of population in the cities is already too great. Fully two thirds of the people of this State dwell in the cities. The conditions ought to be reversed; and, in my opinion, this is one great cause of the complaint of hard times that was so loudly made not many months ago. If there were more people scattered over the State, producing instead of standing idle in the cities consuming, there would be no cause for complaint. How different, too, is home in the country, with its ample fields, its pleasant groves and shady walks, its wholesome food and pure air, from the crowded and unwholesome shelter in the city.

Compare the average farmer's cottage with the average city tenant house. In the former there is always enough to eat, enough to wear, plenty of glorious sunshine and health-giving atmosphere. Near it can be found, or always produced by a small effort, a few cheerful trees with their shade; and there singing birds will come, making merry music for weary hearts. Often there are sparkling brooks filled with fish; woods with wild game; cows that give rich milk, which supplies the table with fresh butter; horses that place it within the reach of all for a pleasant ride; fields of waving grain, or well filled bins or bags, while the poultry of a dozen different breeds sing their songs of contentment. The children rove over the hills with the freedom of the air, happy, strong in body and mind and conscience, growing up to usefulness and honor. On the other hand, the average mechanic and laboring man in the city comes home at evening tired and hungry, to a small, dingy house, of three or four rooms, occupying a space of eighteen by a hundred feet or less; the paint has been washed off by the rains; the fence in front, if there be any at all, is dilapidated; there is no front yard; the small back yard is dirty and lumbered up with boxes and coal, or other trash, because there is no other place for them; no place for shade trees, and but a scanty carpet if any on the floor; the furniture is worn, and nothing looks cheerful about the place, unless the forced smile of the poor wife and mother, who struggles to meet the husband who comes from his daily task with a cheerful face; but sickness at times comes like a great shadow across the door; and then how dark and gloomy is the greeting home. Such is rather more than the average dwelling of the industrious workingmen in the cities. Many of them are obliged to live in tenement houses, crowded together like bees in a hive; sometimes two families in a single room. As for the children, even of the best, they roam the streets subject to the influence of vice in every form. How can any farmer wish for a moment to exchange his lot for such as this? And is it any wonder that so many of our great men come from the country? I am not insensible to the fact that there are periods when the farmer finds the times hard, and prices for the products of his farm not sufficiently remunerative to leave any profit after paying his bills; but reverses come in every vocation of life. So don't get discouraged because the price of wheat is low this year, but get a few more sheep, hogs, and cattle, it costs but very little to raise them, and they always command ready money in the market. Also plant more cherry and other fruit trees and vines; raise your own vegetables, instead of buying from the gardener who lives on the creek; because you can sink a well on your ranch, and set a windmill to work pumping water, that will make your garden teem with all the wonders of the vegetable kingdom. Perhaps, if times are a little hard with you, it is because you want to own too much land. Don't try to buy all the land next to your farm, or own more land than you can successfully cultivate. If you have it, sell off a part of it in lots to some industrious man, even if he has no other capital than industry and honesty, and let him build up a home for himself and family. You will have a good neighbor, and in time he will pay you; and to you will come the double satisfaction of knowing that you have aided a worthy family, and at the same time added to the value of your remaining property by having it surrounded by other lands under a higher state of improvements.

A few words before I close, in relation to the future growth of our State, sitting here, as she does, on the broad shores of the Pacific, where the Occident seems to blend with the Orient. We have here the largest State in the Union except Texas. It contains one hundred and eighty-eight thousand nine hundred and ninety-one square miles, or one hundred and twenty million nine hundred and forty-eight thousand four hundred and eighty acres of land and water. It is seven hundred and seventy miles long in its greatest length, and has an average width of two hundred and thirty miles. Most of this vast area, more than seventy per cent. of it, is good land, suitable for cultivation in grain, wine, etc., or for grazing; the balance is water or timber. The soil is, in many places, exceedingly fertile, and in nearly all it is capable, with proper cultivation, of producing some crop, or yielding good pasturage. The climate is, perhaps, the most salubrious in the world. It is well calculated to incite the population to the highest energy and to stimulate them to the greatest achievements. As yet our population is less than one million. If we may judge by the experience of other and less favored lands, it could easily support a population of thirty millions.

Take Spain, for instance. The area of that country is about the same as of California. The exact figures are about one hundred and ninety-five thousand seven hundred and seventy-four square miles; of this only fifty-three per cent. of the soil is productive, and that is not fertile. Yet that country supports a population which in 1870 numbered over sixteen millions, and it is said that under the Romans it had a population as high as sixty millions; even as late as the tenth century the number is given at twenty-four millions. After retrograding for centuries, the agriculture of the country has been improving of late years, and the population is again on the increase. Spain has not so good a climate as this State, nor is she so favorably located in a commercial point of view. In Italy there are only one hundred and fourteen thousand eight hundred and fifty square miles, and the population in 1871 was nearly twenty-seven millions of people; only forty-eight per cent. of the soil of Italy is arable, and the climate, though salubrious in portions of the country, is thus described by a standard authority: "In Summer a burning heat, unrelieved by refreshing showers, withers all vegetation, parches the ground, and imparts to the landscape a glowing, brownish tint. In many places a subterranean heat periodically sends forth noxious gases. The lagoons and marshes, which border the coast, generate poisonous miasmata. Besides all this, legions of noxious insects fill the air and infest the dwellings." Yet such a country was the seat of empire when Rome ruled the world. It was that climate and that soil from which Cæsar and his conquering legions came forth to power and renown. It was there that Cicero prepared his graceful orations, that the great poets and philosophers lived, that the imperishable principles of the Roman law were formed, by means of which, even yet Rome continues in great part to govern the civilized world, for very much of our law is borrowed bodily, or with slight change, from that source. How much more genial is the climate of our State. We are never troubled with volcanic eruptions, although we have all the benefits of the mild Italian atmosphere. There is scarcely an acre of marsh land or of desert that we may not reclaim. And we have forty-seven millions of acres more than Italy. Who can contemplate, without emotion, the wonderful possibilities before us? What would this State be with twenty-four millions of people, or even ten millions? The time is sure to come when that will be our condition.

The star of the empire has moved westward till it can move westward no further. The broad Pacific places the limit to its progress, and there is nothing left now but to develop what has already been obtained by the grand army of occupation and progress. With such a favorable climate, a good soil, and a fortunate commercial location, the future population of this State ought to be the most enlightened, the most active, energetic, and free people in the world. I have said nothing of the inexhaustible wealth of our mines of gold, silver, copper, iron, coal, and other precious metals, which is such a powerful factor in the progress of a nation's greatness; nor have I referred to the great manufactures, with their improved machinery of modern times. With these taken into consideration, the results of the future are still more difficult to estimate. We do not refer to this in a boastful spirit, but to impress upon each of us the vast responsibility we, as citizens, owe to the commonwealth. We each have a duty to perform, and it is impossible to overestimate the influence that each member of society may exert upon the future of this country. If as farmers, as mechanics, as citizens, as Americans, we do our duty well, the future is full of promise, not only to the present generation, but to those who are to come after us. And unless our conscious strength as a nation shall tempt us to some military excesses abroad, our greatness, with the blessing of the great Author of all, is assured beyond all peradventure. And this fair land, dedicated by our fathers to liberty and freedom, will become so firmly affixed to the soil, that it shall live for all times, and will continue to shine as a beacon light to the whole world, showing that an intelligent people are capable of self-government.

RECEIPTS AND EXPENDITURES.

Receipts.

Received from Park	$3,293 25
Received from Pavilion	863 50
Received from annual memberships	1,095 00
Received from State appropriation	2,000 00
Received from life memberships	800 00
Received from sundry other sources	1,967 46
	$10,019 21

Expenditures.

Paid trotting purses	$1,582 50
Paid running purses	850 00
Paid pacing purses	300 00
Paid office expenses	180 61
Paid commission, etc	95 50
Paid advertising account	1,342 65
Paid National Trotting Association	100 00
Paid premiums—Park	1,569 75
Paid expenses—Park	689 25
Paid premiums—Pavilion	403 50
Paid expenses—Pavilion	904 40
Paid employés—Park and Pavilion	1,041 15
Paid sundry accounts	900 00
	$9,965 31

All of which is respectfully submitted.

LYSANDER WALKER, Secretary.

PREMIUMS AWARDED—1880.

FIRST DEPARTMENT.

Live Stock.	Name of Owner.	Address.	Name of Animal.	Premium.
CLASS I.—THOROUGHBRED HORSES.				
Best stallion, three years old and over	J. A. Cardinell	Oakland	Jack Douglass	$30 00
Second best	E. J. Baldwin	San Francisco	Lexintor	Diploma.
Best stallion, two years old	N. H. Coombs	Napa	Shannon	$15 00
Best stallion, one year old	James Mee	San Francisco	Judge McKinstry	10 00
Best mare, three years old and over	Jos. Cairn Simpson	Oakland	Lady Amanda	20 00
Second best	J. B. Chase	San Francisco	Electra	Diploma.
Best mare, two years old	James Mee	San Francisco	Minnie	$10 00
Best filly foal	Jos. Cairn Simpson	Oakland	Lady Viva	5 00
Second best	J. B. Chase	San Francisco	Winnie C.	Diploma.
CLASS II.—FAMILIES.				
Best thoroughbred sire and five colts				
Best mare and two colts	James Mee	San Francisco	Kittie Pease, with Minnie and Grenstead	$20 00
Best stallion, not thoroughbred, and five colts	W. W. Camron	Oakland	Henry Williamson, with one four-year-old, five one-year-olds, and three sucklings	Silver cup.
Second best	D. F. Majors	Concord	Conductor and nine colts	$15 00
Best dam, not thoroughbred, and two colts	W. W. Camron	Oakland	Fan and four colts	15 00
Second best	B. Boorman	San Pablo	Julia and two colts	Diploma.
Best stallion, three years old	A. Bellina	Hayward	Gen. Grant, Jr.	$20 00
Second best	John Pfau	Petaluma	Eureka	Diploma.
Best stallion, two years old	N. Jones	Lafayette	Marquis	$15 00
Second best	C. B. Foote	Oakland	Tomboy	Diploma.
Best stallion, one year old	W. W. Camron	Oakland	Hunter	$10 00
Second best	Henry Pierce	San Francisco	Setting Sun	Diploma.
Best colt, under one year old	B. E. Harris	San Francisco	Butt Cut	$5 00
Second best	D. E. Camron	Oakland	Pinal	Diploma.
Best mare, three years old	B. E. Harris	San Francisco	Lady Silva	$15 00
Second best	J. B. Horn	Washington	Poscora Maid	Diploma.
Best mare, two years old	W. W. Camron	Oakland	Joan	$10 00
Best mare, under one year old	J. B. Horn	Washington	Fleety Hayward	5 00
Second best	B. E. Harris	San Francisco	Agnes	Diploma.

CLASS IV.—ROADSTERS.

Best stallion, four years old	Gen. Sewell	San Francisco	Boccaccio	$25 00
Second best	H. A. Mayhew	Oakland	Billy Hayward	Diploma.
Best stallion, three years old	Daniel Brown	Petaluma	Jackson Temple	$20 00
Second best	G. W. Congdon	San Francisco	Claremont	Diploma.
Best stallion, two years old	Gen. J. F. Houghton	Oakland	Mohawk Belmont	$10 00
Second best	J. B. Chase	San Francisco	Roscoe	Diploma.
Best stallion, one year old	B. E. Harris	San Francisco	Grenadier	$5 00
Second best	W. W. Camron	Oakland	Hero	Diploma.
Best stallion, under one year old	W. W. Camron	Oakland	Mayday	$5 00
Best span of roadsters—matched	Wm. Nichols	Oakland	Pete and Johnny	25 00
Second best	D. McCarty	Oakland	Jo. McCarty and Harry	Diploma.
Best mare or gelding, four years old	M. W. Hicks	Chico	Fawn	$20 00
Second best	J. McM. Shafter	Olema	Sunbeam	Diploma.
Best mare or gelding, three years old	E. W. Marston	Pescadero	Fred M.	$10 00
Second best	D. McCarty	Oakland	Carrie F.	Diploma.
Best mare or gelding, two years old	M. W. Hicks	Chico	Flight	$5 00
Second best	M. W. Hicks	Chico	Empress	Diploma.
Best mare or gelding, one year old	M. Salisbury	San Francisco	Kate Thorn	$5 00
Second best	B. E. Harris	San Francisco	Emma Boon	Diploma.

CLASS V.—DRAFT HORSES.

Best stallion, three years old	A. Sackrider	Oakland	Bl'k Prince and Fr. Spy	Premium divided.
Second best	J. K. Porter	Petaluma	Gambetta	
Best stallion, two years old	W. A. Watts	Oakland	Billy	$15 00
Best stallion, one year old	B. Boorman	San Pablo	Gladiator	10 00
Best stallion, under one year	W. R. Provo	San Leandro	Chevalier	5 00
Second best	W. R. Provo	San Leandro	Prince	Diploma.
Best mare, three years old	W. W. Camron	Oakland	Beck	$15 00
Second best	B. Boorman	San Pablo	Julia	Diploma.
Best mare, two years old	W. W. Camron	Oakland	Amanda	$10 00
Best mare, under one year	B. Boorman	San Pablo	Claribell	5 00
Second best	J. L. Alexander	Oakland	Nellie	Diploma.
Best span draft horses, in harness	A. Sackrider	Oakland	Pepelon and Pacific	$10 00

CLASS VI.—CARRIAGE HORSES.

Best span carriage horses, to be sixteen hands high, or upwards, owned and used by one person, shown to carriage or buggy—two or more to compete	A. C. Dietz	Oakland	Hayward Chf. & B. Franklin	$20 00
Second best	W. W. Camron	Oakland	Dan. and Coaly	Diploma.
Best saddle horse of either sex	Ben. E. Harris	San Francisco	Gray Dick	$10 00
Second best	W. W. Camron	Oakland	Sabin Harris	Diploma.

First Department—Continued.

Live Stock.	Name of Owner.	Address.	Name of Animal.	Premium.
SWEEPSTAKES.				
Best stallion of any breed or age	James Mee	San Francisco	Judge McKinstry	$50 00
Second best	M. W. Hicks	Chico	Buccaneer	Diploma.
Best mare of any breed or age	James Mee	San Francisco	Katy Pease	$30 00
Second best	Jos. C. Simpson	Oakland	Lady Amanda	Diploma.
JACKS.				
Best jack, two years old	W. A. Munion	Dixon	John Henry	$20 00
Second best	James Boyd	Livermore	Compound	Diploma.
Best jennet, two years old	James Boyd	Livermore	Topsy	$10 00
MULES.				
Best pair of mules owned by one person	James Boyd	Livermore	Pet and Kate	10 00
CATTLE. CLASS I.—DURHAM CATTLE.				
Best bull, three years old	C. Younger	San José	Red Thorndale	25 00
Second best	Robert Ashburner	Baden	Grand Prince of Lightburne	10 00
Best bull, two years old	C. Clark	San José	Gwin Prince	20 00
Second best	Robert Ashburner	Baden	Baden Duke	10 00
Best bull, one year old	C. Younger	San José	7th Red Thorndale	10 00
Second best	C. Younger	San José	10th Red Thorndale	5 00
Best calf, under one year	J. D. Carr	Gabilan	28th Duke of Gabilan	5 00
Best cow, three years old	J. D. Carr	Gabilan	3d Maid of Monterey	20 00
Second best	C. Younger	San José	Red Dolly 2d	10 00
Best cow, two years old	J. D. Carr	Gabilan	Fairy Queen 4th	15 00
Second best	C. Younger	San José	Red Dolly 5th	10 00
Best cow, one year old	C. Younger	San José	6th Rose Forest Home	10 00
Best heifer calf, under one year	J. D. Carr	Gabilan	20th Maid of Monterey	5 00
CLASS II.—AYRSHIRES.				
Best bull, three years old	George Bement	Redwood City	Melancthon Callaghan	25 00
Second best	R. P. Saxe	San Francisco	Scotland	10 00
Best bull, one year old	George Bement	Redwood City	Archie	10 00
Best calf, under one year	George Bement	Redwood City	Eclipse	5 00
Best cow, three years old	George Bement	Redwood City	Maggie	20 00
Second best	George Bement	Redwood City	Lady Chopin	10 00
Best cow, two years old	George Bement	Redwood City	Stellina	15 00

Best cow, one year old	George Bement	Redwood City	Highland Maid	10 00
Best heifer calf, under one year	George Bement	Redwood City	Marietta	5 00
CLASS III.—JERSEY, ALDERNEY, AND GUERNSEY IN ONE CLASS.				
Best bull, three years old	H. Pierce	San Francisco	Hugo of Yerba Buena	25 00
Second best	W. S. McLean	Oakland	Walton	10 00
Best bull, two years old	A. J. Snyder	Oakland	Prince Henry	20 00
Second best	J. McM. Shafter	Olema	Surprise	10 00
Best bull, one year old	W. W. Camron	Oakland	Prince	10 00
Second best	H. Pierce	San Francisco	Deerfoot	5 00
Best calf, under one year	W. W. Camron	Oakland	Duke	5 00
Best cow, three years old	H. Pierce	San Francisco	Eva of Yerba Buena	20 00
Second best	W. W. Camron	Oakland	Young Bloomer	10 00
Special	H. Pierce	San Francisco	Pearl 2d	Diploma.
CLASS III.—JERSEY, ALDERNEY, AND GUERNSEY IN ONE CLASS.				
Best cow, two years old	H. Pierce	San Francisco	Mignonette of Yerba Buena	$15 00
Second best	Jesse Wall	Oakland	Duchess No. 2	10 00
Best cow, one year old	H. Pierce	San Francisco	Annie Cary of Yerba Buena	10 00
Best heifer calf, under one year old	J. H. Coleman	Oakland	Bettie	5 00
CLASS IV.—DEVONS, HEREFORDS, HOLSTEIN, AND HOLDERNESS IN ONE CLASS. [No exhibit.]				
SWEEPSTAKES.				
Best bull of any breed or age	C. Younger	San José	Red Thorndale	40 00
Second best	C. Clark	San José	Gwine Prince	20 00
Best cow of any breed or age	W. W. Camron	Oakland	Young Bloomer (Jersey)	30 00
Second best	C. Younger	San José	2d Rose of Forest Home	15 00
CLASS V.—GRADED CATTLE.				
Best cow, three years old	Page Bros.	Sonoma County	Lady Fragrant	20 00
Best cow, two years old	Page Bros.	Sonoma County	Mamie	15 00
CLASS VI.—HERD OF CATTLE.				
Best herd of cattle of one breed, with not more than one yearling and one two-year-old, consisting of not less than six head, and including one bull two years old or over, owned by one person	C. Younger	San José	Red Thorndale, 2d bull of Avenue Ranch, Red Dolly 2d, 2d Rose of Forest Home, Dolly Thorndale, and 1st Golden Gate	60 00

First Department—Continued.

Live Stock.	Name of Owner.	Address.	Name of Animal.	Premium.
Best herd of cattle of one breed, all under two and one half years old, including but one bull and not more than one calf, consisting of not less than five head, owned by one person	Henry Pierce	San Francisco	Deer Foot of Yerba Buena, Mon. Plaisier of Yerba Buena, Fairy of Yerba Buena, Mignonette of Yerba Buena, Coquette of Yerba Buena, Beauty of Yerba Buena. (Jersey herd.)	$10 00
CLASS VII.—CASHMERE OR ANGORA GOATS.				
Best thoroughbred buck	W. M. Mendenhall	Livermore	Snowflake	10 00
Best thoroughbred ewe	W. M. Mendenhall	Livermore	Nettie	10 00
Best herd of ten goats	W. M. Mendenhall	Livermore		10 00
SHEEP. CLASS VIII.—SPANISH MERINO.				
Best ram, two years old and upward	E. W. Woolsey & Son	Berkeley	Columella	10 00
Second best	J. H. Strobridge	Hayward	Silk Stocking	5 00
Best ram, one year old	J. H. Strobridge	Hayward	Sprightly	7 50
Second best	E. W. Woolsey & Son	Berkeley	Longwool, Jr.	5 00
Best pen, not less than five ewes, two years old	J. H. Strobridge	Hayward		10 00
Second best	E. W. Woolsey & Son	Berkeley		Diploma.
Best pen of ewes, not less than five, one year old and under two	J. H. Strobridge	Hayward		$10 00
Best pen, not less than five ewe lambs	E. W. Woolsey & Son	Berkeley		5 00
Second best	J. H. Strobridge	Hayward		Diploma.
Best ram and five of his lambs	E. W. Woolsey & Son	Berkeley	Columella	$10 00
Second best	J. H. Strobridge	Hayward		Diploma.
FRENCH MERINO.				
Best ram, two years old	Mrs. R. Blacow	Centerville	Leopold	$10 00
Second best	Mrs. R. Blacow	Centerville	Gladiator	5 00
Best ram, one year old	Mrs. R. Blacow	Centerville	Bulger	7 50
Second best	Mrs. R. Blacow	Centerville	Sultan 2d	5 00
Best pen, not less than five ewes, two years old	Mrs. R. Blacow	Centerville		10 00
Best pen of ewes, not less than five, one year old	Mrs. R. Blacow	Centerville		10 00
Best, not less than five, ewe lambs	Mrs. R. Blacow	Centerville		5 00
Best ram and five of his lambs	Mrs. R. Blacow	Centerville		80 00

SILESIAN, COTSWOLD, LEICESTERSHIRE, LINCOLNSHIRE, OR SOUTHDOWN, IN ONE CLASS.				
Best Cotswold ram	Coleman Younger	San José	Far West	10 00
Best pen of Cotswold ewes, five, one year old	Coleman Younger	San José		7 50
SWEEPSTAKES.				
Best ram of any age or breed	E. W. Woolsey & Son	Berkeley	Columella	20 00
Second best	Mrs. R. Blacow	Centerville	Gladiator	10 00
SWINE. CLASS IX.—ESSEX AND BERKSHIRE, IN ONE CLASS.				
Best boar	T. B. Valentine	San Francisco	Black Prince	10 00
Best sow	P. L. Earhart	Oakland	Oakland Queen	10 00
Best sow and pigs—four or more	Charles Mockler	Lafayette	Berkshire	10 00
CLASS X.—POULTRY.				
Best two Light Brahma fowls	T. D. Morris	Sonoma		2 50
Best two Dark Brahma fowls	T. D. Morris	Sonoma		2 50
Best two Partridge Cochin fowls	T. D. Morris	Sonoma		2 50
Best two Black Cochin fowls	T. D. Morris	Sonoma		2 50
Best two White Cochin fowls	T. D. Morris	Sonoma		2 50
Best two Buff Cochin fowls	T. D. Morris	Sonoma		2 50
Best two Plymouth Rock fowls	I. N. Lund	Oakland		2 50
Best two Brown Leghorn fowls	Allen Mayhew	Oakland		2 50
Best two White-faced Black Spanish fowls	P. L. Earhart	Oakland		2 50
Best two Silver Spangled Polish fowls	T. D. Morris	Sonoma		2 50
Best two Dominique fowls	T. D. Morris	Sonoma		2 50
Best two White and White-crested Polish fowls	T. D. Morris	Sonoma		2 50
Best two Black and White-crested Polish fowls	T. D. Morris	Sonoma		2 50
Best two Golden Spangled Hamburg fowls	T. D. Morris	Sonoma		2 50
Best two Black Hamburg fowls	T. D. Morris	Sonoma		2 50
Best two Houdan fowls	T. D. Morris	Sonoma		2 50
Best two Black-breasted Game fowls	T. D. Morris	Sonoma		2 50
Best two Brown-breasted Game fowls	T. D. Morris	Sonoma		2 50
Best two Malay Game fowls	T. D. Morris	Sonoma		2 50
Best two Black-breasted Game Bantam fowls	I. N. Lund	Oakland		2 50
Best pair Bronze turkeys	T. D. Morris	Sonoma		3 00
Best pair wild turkeys	T. D. Morris	Sonoma		3 00
Best pair White Holland turkeys	T. D. Morris	Sonoma		2 50
Best pair Toulouse geese	T. D. Morris	Sonoma		3 00
Best pair Bremen geese	T. D. Morris	Sonoma		3 00
Best pair China geese	T. D. Morris	Sonoma		3 00
Best pair Poland geese	T. D. Morris	Sonoma		3 00

First Department—Continued.

Live Stock.	Name of Owner.	Address.	Name of Animal.	Premium.
Best pair Aylesbury ducks	T. D. Morris	Sonoma		$2 50
Best pair Cayuga ducks	T. D. Morris	Sonoma		2 50
Best pair Guinea fowls	T. D. Morris	Sonoma		2 50
Best pair white Guinea fowls	T. D. Morris	Sonoma		2 50
Best pair Pekin ducks	T. D. Morris	Sonoma		2 50
Best exhibit of poultry	T. D. Morris	Sonoma		10 00

SECOND DEPARTMENT.

MACHINERY, ENGINES, Etc.

Exhibitors.	Address.	Article.	Award.
CLASS I.			
D. M. Osborne	San Francisco	Self-binding harvester	Diploma.
D. M. Osborne	San Francisco	Combined reaper and mower	Diploma.
D. M. Osborne	San Francisco	Self-rake reaper	Diploma.
D. M. Osborne	San Francisco	Mower	Diploma.
D. M. Osborne	San Francisco	Mower	Diploma.
Ayers & Co.	San Francisco	Spring tooth rake	Diploma.
Taunton & Derickson		Adjustable side-hill header wagon	Diploma.
Brown		Wagon tongue support	Diploma.
Ransom		Ransom's patent combined steam tree feller and log crosscut saw	Special mention.
CLASS II.			
Gas Consumers Assoc'n	San Francisco	Patent gas regulator	Diploma.
Dr. Barber		Dry washer	Diploma.
Oakland Gas Light Co.	Oakland	Gas appliances	Diploma.
Swingle & Warner		Green pea sheller	Diploma.
CLASS III.			
John Meyer & Co.		Hand corn planter	Diploma.
CLASS V.			
Frellocher & Mahler		Washing machines	$5 and diploma.
W. E. Gordon		Button hole machine	Special mention.
CLASS VII.			
Northy & Wagar	Oakland	Top buggy	$10 and diploma.
Northy & Wagar	Oakland	Open carriage	$10 00.
Northy & Wagar	Oakland	Lady's phæton	15 00.
S. S. Dunmire	Oakland	Spring market wagon	10 00.
P. H. McGrew	Oakland	Open buggy	10 00.
Mrs. H. I. Plomteaux	Oakland	Afghan	Diploma.
Mrs. Capt. Harwood	Oakland	Quilt	Diploma.
Mrs. W. W. Camron	Oakland	Silk quilt	Diploma.
Mrs. I. W. Phillips	Oakland	Worsted dog	$2 50 & Diploma.
Mrs. G. W. Parsons	Oakland	Bedquilt	Diploma.
Mrs. G. W. Parsons	Oakland	Feather wreath	Diploma.
Mrs. M. Tubbs	Oakland	Knitted shawl	Diploma.
Mrs. M. Tubbs	Oakland	Necktie	Diploma.
Mrs. M. Tubbs	Oakland	Quilt	$2 50.
Mrs. M. Tubbs	Oakland	Worsted rug	2 00.
Mrs. W. F. Cook		Moss work	Diploma.
Mrs. Hegeman		Wax flowers & Autumn leaves	Diploma.
A. Meyer		Hats and caps	Diploma.
Mrs. Thos. Mahoney		Rose work quilt	Diploma.
Miss Louisa Mahoney		Sofa cushion	Diploma.
J. J. Bettman	Oakland	Millinery	Diploma.
Florence Bettman	Oakland	Juvenile millinery	Special mention.
Jos. H. Bacon	Oakland	Confectionery	$5 00.
J. R. Mason	San Francisco	Clark's spool cotton	Diploma.
J. A. Studabaker		Tailor's square	Diploma.

THIRD DEPARTMENT.

EXHIBITORS.	Address.	Article.	Award.
CLASS I.			
Mrs. Hegeman		Rugs and lace shams	Diploma.
Tubbs & Co.	San Francisco	Rope	Diploma.
Charles Peake	San Francisco	Carpets and rugs	$5 00.
CLASS II.			
Pacific Press Publishing Company	Oakland		Diploma.
John Utschig	San Francisco	Dress boots	$2 50.
John Utschig	San Francisco	Heavy shoes	2 50.
John Utschig	San Francisco	Gents' dress shoes	2 50.
John Utschig	San Francisco	Congress gaiters	2 50.
John Utschig	San Francisco	Display of men's boots and shoes	Diploma.
C. A. Broad		Ladies' slippers	$2 50.
C. A. Broad		Ladies' gaiters	2 50.
C. A. Broad		Ladies' bootees	2 50.
C. A. Broad		Display of ladies' and gents' boots, shoes, etc.	Diploma.
CLASS III.			
Miss Susie Mayhew	Oakland	Chenille work	$1 50.
Mrs. C. M. Carlson		Fancy work	Diploma.
Willie Travers	Oakland	Patchwork quilt	Diploma.

FOURTH DEPARTMENT.

EXHIBITORS.	Address.	Article.	Award.
CLASS II.			
F. R. Stevenson	Oakland	Silverware	Special mention.
John Simon	Oakland	Doorknob alarm	Diploma.
CLASS III.			
M. de La Montanya	Oakland	Cooking stove for wood	Dipl'a and $5 00.
M. de La Montanya	Oakland	Cooking range	5 00.
M. de La Montanya	Oakland	Laundry stove	5 00.
J. C. Todd		Hot air grate	Diploma.
Oakland Gas Company	Oakland	Gas heating and cooking stoves	Diploma.
CLASS IV.			
Kohler & Chase	Oakland	Display of musical instruments	Diploma.
A. Bruenn	Oakland	Hall's pianos	Diploma.
B. F. Farrar	San Francisco	Mattresses	$5 00.
B. F. Farrar	San Francisco	Spring bed	5 00.
B. F. Farrar	San Francisco	Spring mattresses	Special mention.
B. F. Farrar	San Francisco	Slat spring bed	Special mention.
B. F. Farrar	San Francisco	Sectional spring mattresses	Special mention.
B. F. Farrar	San Francisco	Mattresses in sections	Special mention.
J. Kendleberger		Pillow sham holder	Diploma.
C. L. Taylor	Oakland	Display of upholstery	Diploma.
CLASS V.			
C. L. Taylor	Oakland	Willowware	Diploma.
CLASS VI.			
Pierce & Co.	Oakland	Fishing tackle	Diploma.
Dr. E. T. Burnette	Oakland	Dentistry	Diploma.

FOURTH DEPARTMENT—Continued.

EXHIBITORS.	Address.	Article.	Award.
CLASS VII.			
S. H. Tyler & Son		Spices	Diploma.
C. B. Rutherford	Oakland	California varnish	$2 00.
C. B. Rutherford	Oakland	Premium paints	Diploma.
C. B. Rutherford	Oakland	Sign and ornamental paintings	Diploma.
W. T. Coleman	San Francisco	Royal baking powder	Diploma.
John Cushing	Oakland	Groceries	Diploma.
Whittier, Fuller & Co.	Oakland	White lead	$2 00.
Whittier, Fuller & Co.	Oakland	Mixed paints	Special mention.
A. G. Scott		Russian polish	Diploma.
CLASS VIII.			
F. R. Stevenson	Oakland	Stoneware, glassware, queensware, and ground and cut glass	Diploma.
F. R. Stevenson	Oakland	Decorated toilet ware	Diploma.
F. R. Stevenson	Oakland	Bronzes and majolica	Diploma.
CLASS IX.			
J. Homer Fritch	Oakland	Carbon Hill coal	Diploma.

FIFTH DEPARTMENT.

EXHIBITORS.	Address.	Article.	Award.
CLASS II.			
G. W. Parsons	Oakland	Barley	Diploma.
G. W. Parsons	Oakland	Oats	Diploma.
D. F. Majors	Contra Costa Co.	Seed wheat	Diploma.
CLASS III.			
G. W. Parsons	Oakland	Potatoes	$2 00.
G. W. Parsons	Oakland	Sweet green corn	Diploma.
G. W. Parsons	Oakland	Crookneck squashes	Diploma.
CLASS IV.			
H. P. Livermore	Oakland	Best display of plants suitable for conservatory, greenhouse, and window culture	$10 00.
James Hutchinson	Oakland	Best collection of flowering plants in bloom	20 00.
James Hutchinson	Oakland	Best cut flowers	10 00.
James Hutchinson	Oakland	Best bouquets	10 00.
R. Turnbull	Oakland	New and rare plants	10 00.
G. J. Nicholson	Oakland	Best collection of ornamental foliage plants	20 00.
G. J. Nicholson	Oakland	Best fuchsias	5 00.
Geo. B. Bailey	Oakland	Hanging baskets	$10 and Diploma.
P. J. Keller	Oakland	Rustic work	$10 00.
E. Gill	Oakland	Roses	5 00.
E. Gill	Oakland	Australian plants	10 00.
Geo. W. Gunn	Oakland	Rustic chair	Special mention.
CLASS V.			
P. Nelson	Lafayette	Butter machine	Diploma.
CLASS VI.			
John Nash	Oakland	Best display of bread	Diploma.

SIXTH DEPARTMENT.

EXHIBITORS.	Address.	Article.	Award.
CLASS I.			
E. W. Garbet	Alameda	Best display of apples and pears.	Diploma.
Porter Bros. & Wing	Oakland	Apples	$10 00.
Porter Bros. & Wing	Oakland	Pears	10 00.
Porter Bros. & Wing	Oakland	Plums, figs, tropical fruits	Diploma.
CLASS II.			
G. W. Parsons	Oakland	Canned fruit and jellies	Diploma.
CLASS III.			
H. B. Spiller	San Francisco	Neuralgia cure	Diploma.
James H. Gates	San Francisco	Pepsin Wine Bitters	Diploma.
H. Palmer	San Francisco	Display of wines (California)	Diploma.
Porter Bros. & Wing	Oakland	Display of grapes	Diploma.

SEVENTH DEPARTMENT.

EXHIBITORS.	Address.	Article.	Award.
CLASS I.			
E. D. Ormsby	Oakland	Photographs	$20 00.
Jules Tavernier	San Francisco	Best landscape, in oil	20 00.
Mrs. D. W. Gelwicks	Oakland		Diploma.
Frank M. Pebbles	Oakland	Best portrait, in oil	$20 00.
Frank M. Pebbles	Oakland	Best painting by any exhibitor.	25 00.
Miss Vincent	Oakland	Three pictures	Diploma.
J. B. Wanderforde	Oakland	Best landscape, in water colors	$15 00.
Mrs. M. E. Landin	Oakland		Diploma.
R. Bush	San Francisco	Best animal painting	$10 00.
Mrs. E. J. Norton	San Francisco		Diploma.
Mrs. M. E. Fountain	Oakland	Best photo crayon	$10 00.
C. D. Robinson	San Francisco	Best marine painting	20 00.
Miss Bowen	Oakland	Best painting, in oil (juvenile)	25 00.
Hattie Bay	Oakland	Best crayon	Diploma.
Miss Sadie McKee	Oakland	Best painting, in water colors	$25 00.
M. Strauss	San Francisco	Best exhibition by one artist	50 00.
Fred. Richart	Oakland	Best flower piece	10 00.
Mrs. A. W. Brodt	Oakland	Decorated china	10 00.
Mrs. Higeman	San Francisco	Decorated china	Diploma.

SPEED PROGRAMME--1880.

FIRST DAY—MONDAY, SEPTEMBER 13, 1880.

No. 1—Running.

Two-year old stake, three-quarter mile dash; fifty dollars entrance; fifteen dollars forfeit, one hundred and fifty dollars added; second colt to save stake.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Duke of Norfolk, by Norfolk; dam, Marion, by Malcolm	Theo. Winters	San Francisco.
Brown Colt, by Shannon; dam, Ruth, by Lodi	N. H. Coombs	San Francisco.
Zeta Psi, by Monday; dam by Dougherty's Arabian	Leo. Lynch	Pleasanton.

Result.

Duke of Norfolk	1
Shannon Colt	2
Zeta Psi	3

Time—1:22¼.

No. 2—Running.

Three-year old stake, one and one-quarter mile dash; fifty dollars each; fifteen dollars forfeit; one hundred and fifty dollars added; second to save stake.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Jack Douglass, by Wildidle; dam, Lady Clark	John A. Cardinell	San Francisco.
Connor, by Norfolk; dam, Ada C	Theo. Winters	San Francisco.
Flood, by Norfolk; dam, Hennie Farrow	Theo. Winters	San Francisco.

Result.

Connor	1
Jack Douglass	2

Time—2:14½.

No. 3—Running.

Stake, free for all; one mile and repeat; fifty dollars each; fifteen dollars forfeit; two hundred dollars added; second horse to save stake.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Twilight, by Norfolk; dam, Kate Gift, by Lodi	Theo. Winters	San Francisco.
Connor, by Norfolk; dam Ada C	Theo. Winters	San Francisco.
Clara D., by imp. Glenelg; dam, The Nun	E. J. Baldwin	San Francisco.
Jim Farley, by Hubbard; dam, by Lexington	N. H. Coombs	San Francisco.

Result.

Clara D	1	1
Jim Farley	2	2

Time—1:56; 1:51½.

SECOND DAY—TUESDAY, SEPTEMBER 14, 1880.

No. 4.—Trotting.

Two-forty class. Purse, six hundred dollars. First horse, three hundred dollars; second horse, one hundred and fifty dollars; third horse, ninety dollars; and fourth, sixty dollars. (Dietz mare barred.)

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Clay, by Fred. Low; dam, Maid of Clay	H. R. Covey	Palo Alto.
Tommy Dodd, by Alexander; dam, a Clay mare	R. C. Milroy	San Francisco.
John Freaner, by Erricson; dam, a Star mare	G. W. Trahern	Stockton.
Sir Guy, by The Moor; dam, by Stormy John	E. L. Mayberry	San Gabriel.
San Mateo Belle, by Speculation; dam, Young Lady Vernon	W. Z. Price	San Mateo.
Tom Stout, by The Moor; dam, by Argyle	John Williams	Stockton.
Mollie Drew, by Winthrop; dam, Fanny Fern	James Price	Oakland.
Lady Ellen, by Carr's Mambrino; dam, by Owen Dale	D. I. Green	San Francisco.
Buccaneer, by Iowa Chief; dam, by Flaxtail	M. W. Hicks	Chico.
Venus, by Venture; dam unknown	Ben. Timmins	Sacramento.

Result.

Tommy Dodd	1
Sir Guy	2
Tom Stout	3
Lady Ellen	4

Time—2:31¼; 2:30½; 2:28¾; 2:29½.

No. 5.—Trotting.

Two-twenty-three class. Purse, seven hundred and fifty dollars. First horse, three hundred and seventy-five dollars; second, one hundred and eighty-seven dollars and fifty cents; third, one hundred and twelve dollars and fifty cents; fourth, seventy-five dollars.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Brigadier, by Happy Medium; dam, Lady Turner	J. B. McDonald	Marysville.
Magdallah, by Primus; dam, unknown	John Dexter	San Francisco.
Bateman, by H. Clay; dam, by American Star	M. Salisbury	San Francisco.
Pat. Hunt, by Tecumseh; dam, by St. Clair	D. R. Hunt	Napa City.
Volney, by Volunteer	E. J. Baldwin	San Francisco.
Barney	D. S. Frazier	San Francisco.

Result:

Brigadier	1
Bateman	2
Pat. Hunt	3

Time—2:28; 2:33.

THIRD DAY—WEDNESDAY, SEPTEMBER 15, 1880.

No. 6.—Running.

Free for all, two-mile dash. Fifty dollars each; fifteen dollars forfeit; two hundred and fifty dollars added. Second horse, one hundred dollars; third, to save stake.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Jennie B., by imported Glenelg; dam, Regan	E. J. Baldwin	San Francisco.
Lillie B., by Longfellow; dam, Sallie Travers	F. S. Malone	San Francisco.
Mattie Glenn, by Glen Athol; dam, Mattie Gros	Theo. Winters	San Francisco.
Flood, by Norfolk; dam, Hennie Farrow	Theo. Winters	San Francisco.

Result:

Jennie B.	1
Mattie Glenn	2
Lillie R.	3

Time—3:37.

No. 7.—Running.

Free for all three-year-olds; mile and repeat. One hundred dollars each; twenty-five dollars forfeit; one hundred and fifty dollars added. Second horse to save stake.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Connor, by Norfolk; dam, Ada C.	Theo. Winters	San Francisco.
Flood, by Norfolk; dam, Hennie Farrow	Theo. Winters	San Francisco.
Jack Douglass, by Wildidle; dam, Lady Clare	John A. Cardinell	San Francisco.

Result:

Connor	1	1
Jack Douglass	2	2

Time—1:45; 1:46.

FOURTH DAY—THURSDAY, SEPTEMBER 16, 1880.

No. 8—Trotting.

Purse, five hundred dollars. Free for all. First horse, three hundred dollars; second, one hundred and fifty dollars; third, fifty dollars.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Phaceola, by Silver Threads	Newland & Pumyea	Oakland.
Alex. Button, by Alexander; dam, Lady Button	Steve. Crandall	Petaluma.
State of Maine, by Elmo; dam, Kitty Clyde	E. L. Mayberry	San Gabriel.
Annie Laurie, by Echo; dam, by Tenbrook	Wm. Smith	Savannah.
Len. Rose, by A. W. Richmond; dam, Barbara	C. A. Durfee	Los Angeles.

Result:

Annie Laurie	1
Alex. Button	2
Len. Rose	3

Time—2:34; 2:36¼; 2:34; 2:35.

No. 9—Pacing.

Purse, five hundred dollars; free for all. First horse, three hundred dollars; second, one hundred and fifty dollars; third, fifty dollars.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Dido, by Scott's Hiatoga; dam, Columbia	I. N. Killip	San Francisco.
Johnny Wiegle; unknown	George A. Vignole	Los Angeles.
Washington, by Bucephalus; dam, a Leviathan mare	S. Sperry	Petaluma.
Nimrod; unknown	W. H. Cade	Oakland.

Result.

Nimrod	1
Johnny Wiegle	2
Washington	3

Time—2:23¼; 2:26½; 2:20¾; 2:26; 2:26; 2:28½.

No. 10—Trotting.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Buccaneer, by Iowa Chief; dam, by Flaxtail	M. W. Hicks	Chico.
Venus, by Venture; dam unknown	Ben. Timmins	Sacramento.
Nephew, by Hambrino; dam, full sister to Pacing Abdallah	G. W. Trahern	Stockton.
Lady Gertrude; unknown	D. McCarty	San Francisco.
Gentle Annie, by ———	G. T. Hartwell	Napa.
Pinole Patchen, by Liberty Patchen; dam, Morgan and Timoleon mare	I. H. Tennant	Oakland.
Major, by unknown	N. A. Corvarubias	Los Angeles.
Del Sur, by The Moor; dam, Gretchen, by Mambrino Pilot	L. J. Rose	San Gabriel.

Result.

Del Sur	1
Pinole Patchen	2
Venus	3
Lady Gertrude	4

Time—2:29½; 2:31; 2:31.

FIFTH DAY—FRIDAY, SEPTEMBER 17, 1880.

No. 11—Special Trotting.

Purse, five hundred dollars; first horse, two hundred and fifty dollars; second, one hundred and twenty-five dollars; third, seventy-five dollars; and fourth, fifty dollars.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Sir Guy, by The Moor; dam, by Stormy John	William Donathen	Los Angeles.
Lady Gertrude; unknown	D. McCarty	San Francisco.
Lady Ellen, by Carr's Mambrino; dam, by Owen Dale	D. J. Green	San Francisco.
Mollie Drew, by Winthrop; dam, Fanny Fern	James Price	Oakland.
San Mateo Belle, by Speculation; dam, Young Lady Vernon	W. Z. Price	San Mateo.
Fawn, by ———	M. W. Hicks	Chico.

Result.

Sir Guy	1
Fawn	2
Lady Ellen	3
Mollie Drew	4
Lady Gertrude	5

Time—2:30½; 2:29¼; 2:28½; 2:28½.

SIXTH DAY—SATURDAY, SEPTEMBER 18, 1880.

No. 12—Trotting.

Two twenty-seven class. Purse, seven hundred and fifty dollars. First horse, three hundred and seventy-five dollars; second, one hundred and eighty-seven dollars and fifty cents; third, one hundred and twelve dollars and fifty cents; fourth, seventy-five dollars.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Echora, by Echo; dam, by Jack Hawkins	L. H. Titus	Los Angeles.
Gus, by Williams' Bellfounder; dam, Jenny Noyes	M. Mooney	San Francisco.
Captain Jenks, by Norfolk: dam, by Belmont	Ben. Timmins	Sacramento.
Cassie Mack, by McClellan; dam, Sabella	D. McCarty	San Francisco.
Dirigo, by Fox Hunter; dam, unknown	W. W. Moore	Oakland.
Volunteer, by Gen. Dana; dam, Damsel	Daniel Brown	Petaluma.
Startle, by the Andrews horse; dam, Maggie, by the Aroostook horse	E. W. Marston	Pescadero.

Result.

Echora	1
Volunteer	2
Startle	3
Gus	4
Captain Jenks	5

No. 13—Trotting.

Free for all. Purse, seven hundred and fifty dollars. First horse, four hundred dollars; second, two hundred and fifty dollars; and third, one hundred dollars.

Name and Pedigree of Horse.	By Whom Entered.	P. O. Address.
Santa Claus, by Strathmore		
Nutwood, by Belmont; dam, Miss Russell, by Pilot, Jr.	J. W. Knox	San José.
Abbotsford, by Woodford's Mambrino; dam, Columbia	I. N. Killip	San Francisco.
Magdallah, by Primus; dam, unknown	John Dexter	San Francisco.

Result.

Santa Claus	1
Nutwood	2

Time—2:22; 2:24; 2:18.

TRANSACTIONS

OF THE

SAN JOAQUIN VALLEY AGRICULTURAL ASSOCIATION,

District No. 2.

1880.

BOARD OF DIRECTORS FOR 1880.

DIRECTORS.

L. U. SHIPPEE	Stockton.
R. C. SARGENT	Woodbridge.
H. W. WEAVER	Stockton.
J. A. LOUTTIT	Stockton.
J. A. SHEPHERD	Lathrop.
FRED. ARNOLD	Stockton.
J. E. MOORE	Stockton.
JOHN H. O'BRIEN	Stockton.

OFFICERS OF THE BOARD.

President,	
L. U. SHIPPEE	Stockton.
Treasurer,	
A. W. SIMPSON	Stockton.
General Superintendent of Pavilion,	
JOHN H. O'BRIEN	Stockton.
Superintendent of Track,	
S. BRIGGS	
Secretary,	
J. M. LaRUE	Stockton, P. O. Box 188.

CORRESPONDING MEMBERS.

Calaveras County.	
T. J. MATTESON	of Murphys.
R. W. RUSSELL	of San Andreas.
Stanislaus County.	
F. H. ROSS	of Modesto.
T. J. YOUNG	of Modesto.
Mariposa County.	
DANIEL WAGNER	of Coulterville.
W. F. COFFMAN	of Mariposa.
Merced County.	
H. A. BLOSS	of Merced.
J. J. STEVINSON	of Merced.
Fresno County.	
A. J. PEDLAR	of Fresno.
H. C. DAULTON	of Berenda.
Tulare County.	
I. N. WRIGHT	of Tulare.
E. JACOBS	of Visalia.
Tuolumne County.	
D. McLEAN	of Sonora.
JOHN PARSONS	of Columbia.
Kern County.	
SOL. JEWETT	of Bakersfield.
Dr. THORNTON	of Bakersfield.

REPORT.

San Joaquin Valley Agricultural Association,
District No. 2, Stockton, California, November 30, 1880.

Hon. I. N. Hoag, Secretary State Board of Agriculture, Sacramento:

Sir: I have the honor to herewith transmit my report for the fiscal year ending December 1, 1880.

Very respectfully,
J. M. LaRUE,
Secretary.

ANNUAL ADDRESS,

By Hon. Frank M. Pixley, of San Francisco.

Mr. President, Ladies and Gentlemen: The triumph of our country is the triumph of labor over land. It is the achievement of the ax over the forest; of the plow over the prairie. Its march began with the Mayflower passengers in New England, westward across the continent, building homes and creating farms, subduing the primal wilderness and subjecting its soil to the demands of cultivation; wresting its grains and fruits with the keen edge and shimmering blade of plow and spade. The steady, onward tramp of the invading toiler was westward till it reached the Pacific, and with gleaming picks made the Sierras give up the treasures of their hidden wealth, gold and silver, and only stayed his march because the continent was no broader and there was no farther West for the Argonauts to explore.

Other nations had their conquests and their achievements, more brilliant, perhaps, than ours. Armies have marched with the splendor of banners, and armed men have conquered by the force of arms. The genius of war has displayed itself with the terror of invading hosts, but in all the history of civilization there has been no grander victory than the peaceful conquest of a virgin continent by the army of free labor. This army has not confined itself to the subjection of mine and field and forest; not been content with material triumphs over wave and furrow; has not rested with inventions and improvements in the dominion of science and art and letters, but it has achieved its victories in the nobler fields of conflict. It has declared the freedom of the intellect, and that conscience should be free. It has declared the equality of man, and did not rest until all were free. It has not allowed itself to be hampered by laws of primogeniture and entail, and gives the honor of public station and the rewards of social life as prizes for all who will honorably contend for them. These heroes, this army, are the American farmers, planters, and ranchmen.

To a little division of this Grand Army of the Republic, stationed here upon the westmost verge of the continent, do I now address myself. You are the picket guard of the most advanced post of the west, and now, after a bounteous harvest, fully garnered, you meet for review.

I have no such knowledge of your art of agriculture that I can give you advice in the details of its pursuit. Although I was a farmer's boy, and followed the trail of the plow, it was under such changed conditions of seasons, soil, climate, and productions, that my knowledge would not avail you. I think you have found that the knowledge gained from your own experience has been a better teacher than that gained from books. I can only talk of the literature of land. My farm lore comes from books. I have a farm, it is true; in fact, I have two. Upon one I raise imported Jersey cows. I paid twelve thousand dollars for two hundred acres, ten years ago. My cows cost me three hundred and fifty dollars a head. I have raised blooded colts—Elmo, Hambletonian, Warwick—and I am ashamed to confess that I have one Copperhead. I never sold but one Jersey calf in all these years. The price was fifty dollars, and there is still owing me twenty dollars on account. It is the only cent I ever received from that farm. I raised an Elmo colt. I paid one hundred and seventy-five dollars to get him. When he was five years old I traded him off for seventy-five dollars. I have observed a curious fact in the horse market. When I want to buy a horse they are scarce and dear. Whenever I want to sell the market is glutted, and horses are a drug. Farming is a gentlemanly pursuit, but gentleman farming does not pay—that is, it does not pay me, and I am compelled to admit that I am a failure; as a farmer, I mean, not as a gentleman, I hope. [Laughter and cheers.] Having an upland, hilly farm, I was troubled with dry seasons; so I said to myself, I will get the best of the good Master, I will hedge; I will buy a tule farm. So in wet Winters I will get a crop on the uplands, and in dry seasons I will get a crop from the swamp lands. So I purchased, in Contra Costa County, just across the San Joaquin, a piece of tule land. I have successfully reclaimed it. In fact, I have successfully reclaimed it five times, and every time the levee broke; and you can hold a regatta over where I have sown my grain. A few weeks ago the levee burst again, from the melting snows of the Sierra, and I am compelled to admit that my theology is as defective as my farming, and that so far, I have not been able to outwit God Almighty. From the only tenant I ever had on that land, the only rent I ever received was one Christmas turkey. That turkey cost me something over six thousand dollars.

I make an admission of these melancholy failures to illustrate how little I know of practical farming in California, as an apology for what this address shall lack of practical information, and as an admonition for your Society to procure your lectures from farmers in the future.

The opening address of H. M. Larue, President of the State Agricultural Society, is a refreshing departure from the stereotyped formulas of gushing brag to which we have hitherto been accustomed. That we have the finest climate, and can raise the finest pumpkins in the world, is now generally conceded. I have not time to review this address, and can only commend to our agricultural friends its perusal in such of our daily and weekly journals as will give it space. I would make only one criticism, and that is this: Mr. Larue has treated farming solely from one standpoint, viz.: as a money making industry. He sees in great fifty-thousand-acre farms, worked by machinery, an evidence of the progress of the age. He advises the construction of great warehouses, to be owned by farmers, and regards the transportation question with reference to its profit to the producer. All his reasoning tends to a consideration of the money side of farming. Now, in my judgment, there are other and vastly more important questions to be considered, and they all lie in the direction of small farming, the raising of miscellaneous crops, the effort to make the farm self-sustaining; to increase the number and character of the families of a farming neighborhood; the multiplication of school houses; to beautify the landscape by the planting of fruit, ornamental, and forest trees; drainage with reference to health; experimenting in the direction of increasing the comforts and pleasures and refinements of life; elevating society to a higher plane, and one upon which the pillars of our republican government shall rest upon a better and firmer basis, than a community where a few great fifty-thousand-acre farmers exploit the soil by machinery, and the employment of less than three hundred men. Such farming as this may enrich the particular owner, but it introduces a feudal system. It makes the State a wilderness, and brings society back to the barbarism of the mediæval age. It destroys homes and the family. It breeds tramps and idlers. It destroys churches and school houses. It would in time present the great, beautiful valleys of our State as treeless, verdureless plains. All our ideas and recollections of farm life come from an entirely different condition of things. My father's farm in Western New York was one hundred and fifty acres of land, upon the banks of a beautiful creek, in the County of Genesee. Its water power afforded the opportunity of a sawmill and a linseed oil mill. Up and down the creek were other mills, for flouring, sawing stone, carding wool, turning woods, and so on through all the line of simple manufacturing industries. The bottom land was rich in grasses, upon which was kept a small dairy of well bred cows. This land furnished clay, from which we burned an annual kiln of brick, to sell to our neighbors. About forty acres a year was devoted to the cultivation of wheat, alternating the crop, and fertilizing the soil by red clover turned under in the fall plowing. This clover gave honey from half a dozen hives of bees. Our orchard bore Summer and Winter fruit, great, hard, juicy apples, and cider for the Winter nights, when we gathered around the mother's table to study and to read, or to indulge in the games and pleasures of a long, cold, country evening.

On this farm, fenced in small fields with an old fashioned Virginia rail fence, with the largest rail on top, we raised oats, potatoes, and corn. Between the rows of corn we raised pumpkins, and from pumpkins, pies. We dried the pumpkins for Winter use. Plums, cherries, pears, and peaches were among our fruits. These were preserved and canned. Of grapes, we had Catawbas and Isabellas. Our mothers made currant wine, and jams of strawberries, raspberries, and blackberries. Cauliflowers, onions, tomatoes, and cucumbers, were eaten fresh and pickled. Corn gave us fat hogs, and from fat hogs we made ham and bacon and sausages; spare-ribs and sweetbreads and scraps in killing time. We had butter, and cream, and milk, and eggs, chickens, turkeys, and ducks. Our few sheep gave us wool for stockings—knit at home—and lamb with mint sauce. Our working farm mares were bred to blooded horses for colts to sell. Our small forest gave wood for fires, and maple sugar and syrup for slapjacks. To the neighboring mill we sent grists of wheat and corn. Wheat and oats and dairy products gave us money to buy groceries and clothes and books, and to pay schooling and pew rent, and subscriptions to the Albany *Evening Journal*, the *Tribune*, *Graham's Magazine*, and *Godey's Lady's Book*. For game, we hunted the coon in green corn and watermelon time, killed woodchucks and gray squirrels. We had frogs from the mill pond, fish from the creek. We gathered beech nuts, hickory nuts, and butternuts, which we cracked on Winter nights, and added to the feast of apples and cider. We had quilting frolics, and paring bees, and candy pullings, and spelling schools; went sleigh riding with the girls in Winter, and to picnics in Summer. We had Fourth of July celebrations, and "general training," and house-raisings, and corn-huskings. Our boots were made from home-tanned calf skins by the cross-roads shoemaker, and our clothes by a seamstress who came to the house. The girls wore Merrimac calico, at twelve and a half cents a yard—seven yards made a frock of fast colors, and warranted to wash, the hooks and eyes and trimmings thrown in. This was country life on a small farm in Western New York. It was pleasant, joyous life—a life of labor, study, and play. It was the type of country life. It made good men and good women. It taught industry, economy—made good citizens. It was a good and prosperous community. Children honored and obeyed their parents, and parents worshiped God. There were no hoodlums among the boys, no prostitutes among the girls. Marriage was a sacrament, and divorce unknown. This education gave the nation scholars and thinkers, statesmen and patriots. It laid broad and deep the foundations of the State. The ballot box was kept sacred and inviolate. Legislation was honest. Laws were enforced and obeyed. Republican government meant the control of an intelligent majority.

All this was the fruit of small farming in Western New York half a century ago. It would be tedious to recite the home-raised comforts of this kind of farming life, or enumerate the variety of grains, fruits, vegetables, products of daily toil from field and mill; the pleasures and frolics of ice and snow, and the charming pursuits of Summer, with gun and rod; the toil during the school vacations; the chores of morning and noon and night, when attending the district school, where only English was taught, and the humbuggery of the present system had not invaded; a home that never knew a reasonable want unsatisfied; where father, mother, sons, and daughters all toiled; where labor was honorable and honored; where the hired man and the hired maid were called "help," and sat in equal honor at the farmer's long harvest table; a system which gave to fifty thousand acres of land three hundred and thirty-three farms, and—averaging by our family of ten persons—support, maintenance, and education to three thousand three hundred and thirty-three persons; that gave a flourishing village, with churches and schools on every square of ten miles, and was the basis, firm and unchanging, upon which were reared the trade, the industry, the commerce of the magnificent Empire State. Such farms as this would transfigure the Valleys of the San Joaquin and Sacramento, the great plains of Salinas and Santa Clara. Like the fruitful plains of Lombardy, nestled beneath the Julian Alps, they would literally blossom like the rose, for fruitful gardens produce everything that ought to be demanded to make men happy and build up a State.

A recent magazine writer declares that large farming is not farming at all. It is mining for wheat. In one point of view, it is a manufacturing business in which clods are fed to the mill and grain appears in carloads. Such farming holds the same relation to society as does a manufacturing corporation. Their laborers are workers for six months, and tramps the other six. Foreign distress their friend, and the world's hunger their steady customer. Mr. Larue has considered only the sterner features of the guild: the order, the machine, the minimum of expense, the maximum of product, and not to those pleasanter features to which I have referred: the school house, the church, the library, the social circle, the moral influence, the intelligence that lays at the base and foundation of the political and governmental fabric. This kind of farming would *make* California. One third of its population would not gather in its one great city, in which city one portion lives in discontented poverty, one portion hangs by its eyelids upon the ragged edge of genteel pauperism; and one part lives as live the fish in the sea—by eating each other. It would give our State a splendid, happy people—a satisfied, prosperous, and contented population, with no swarming sandlots, no scheming politicians, no discontented, unhappy gambling classes.

Small farming is the panacea for about all the ills of life. It is a solution of all the most vexed problems of political economy. In that country where the people who own the land cultivate it, and govern it, the doctrines of Malthus, and Ricordo, and Adam Smith, and all the philosophers who have endeavored to accommodate the science of government to the use of the class that has conquered States and monopolized its lands, will not apply. All this will come in time, and it will come to our country. It is coming now to the Southern States, to the Western States, and we begin to see the iron grasp of the great land monopolist relaxing here in California. May the good God speed the coming of that happy time, when in Europe and in America, in Ireland and in California, every man who is willing to till the land shall have as much, and no more, than he can advantageously cultivate.

Agriculture is of all the sciences the one that progresses most slowly, but the one that never takes a step backward, and rarely ever a doubtful step in advance. The art of husbandry is older than history. It is older than the hieroglyphics on Assyrian tombs. By the ancient Greeks, the art of agriculture was assigned to Hiptolemus, and he was taught by Ceres, an unprofitable fable, showing that agriculture is historically older than fable or story.

In every free country, among every free people, it has held the highest rank among the peaceful arts, and it has never been degraded except among a degraded people that have first lost their liberties.

[Mr. Pixley here spoke at length upon the science of agriculture as practiced in Egypt under the Ptolemies, showing that they knew much agricultural science, and also of irrigation.]

Adam, I take it, was the first gentleman farmer who lived in the country and enjoyed the luxury of a Summer resort, a place where he took his wife, our good old mother Eve, to spend the honeymoon of their early creation, and where their first babies were born, and where the children had the full benefit of open air exercises. I think it is nowhere remarked that Adam had any special knowledge of farm work, and as I understand, the place upon which he lived was rather a fancy fruit farm than a ranch for general cultivation.

In that primitive time there was not so very great a necessity for labor as now. There were not so many artificial wants to be supplied. If labor was brought into the world as a penalty for sin, while I would not be impolite enough to blame a lady, and she the first lady and in fact the only lady of her time, for eating the forbidden apple under the temptation of the serpent, I wish there had been no apples in the Eden farm, and I sincerely wish there had been no sycophantic, crawling devil to have tempted her. Out of this temptation and fall came all the trooping curse of artificial wants.

I can conceive of no more delightful position on earth than to be the owner in fee simple, without mortgage or taxes, of a thoroughly irrigated farm on the banks of the Euphrates, or the San Joaquin or Stanislaus, or any other nice stream, where the soil is so rich that it would produce crops without labor, growing vines without the phyloxera, raise wheat without rust, or lodgment or wevil, and fruit without effort; where one's wife had no excuse to vex with milliner's bills, or had any necessity for expensively fine clothes; where one's boys had no temptation from any girls nearer than the land of Nod to lead them into the vanities of claw hammer coats and kid gloves; where there were no ladies' seminaries to create a demand for pianos and a taste for novel reading.

* * * * * * * *

The capacity of a country like this valley of the San Joaquin is absolutely unlimited if it was cultivated as in ancient times was the soil of the countries to which I have referred. Egypt, Italy, Spain, were not unlike this valley; they all demanded irrigation, and they all attained their highest prosperity when irrigation and cultivation reached their highest development. The countries that to-day are producing the greatest results are those where irrigation is in demand, as India and the plains of Lombardy, where artificial appliances are brought forward to aid nature, as in the reclamation of lands in Holland, not unlike our reclamation of tule lands; but this higher degree of development is only possible under conditions which every single man in this audience will refuse to accept. Small farms well cultivated; all the water taken from your river beds, all the waste wealth of melting snows stored up in your mountains and utilized by distribution through artificial pipes; all the dry lands irrigated, and all the wet land reclaimed, and all cultivated to their capacity, and this County of San Joaquin would support more people than now live west of the Rocky Mountains, and would support them with more ease, with less labor and more comfort, and give to them more luxuries and social and intellectual enjoyments than the average people of this State now enjoy. Your landscape would become a picture of rural beauty; there would be a schoolmaster and a doctor on every section; there would be a library in every town, and if you could keep gin mills altogether away, become temperate enough to drink your own wine, and sensible enough to indulge only in honest politics, the County of San Joaquin would be a paradise like that where Adam dwelt, a granery like that of the Nile, which fed Rome and produced an annual revenue equal to all Spain in its best days.

SECRETARY'S FINANCIAL REPORT.

Receipts.

Received for season membership tickets sold	$1,791 00
Received for life membership tickets sold	150 00
Received for single tickets sold	2,961 00
Received for entries and forfeits	3,015 00
Received for quarter stretch and hack badges sold	167 50
Received for grand stand tickets	350 00
Received for privileges	2,215 50
Received for donations to date	265 00
Received for sweepstake fees	27 50
Received from sale of hay	106 90
Received from State Controller's warrant	1,500 00
Received from bills payable	2,781 23
Received from all otner sources	8 45
Balance January 10, 1880	20 81
	$15,359 89

Disbursements.

Paid indebtedness of 1879	$616 90
Paid bills payable, 1880	1,500 00
Paid entrance fee returned to J. C. Simpson	70 00
Paid purses, to date	4,742 50
Paid premiums, to date	1,268 50
Paid for permanent improvements	3,422 42
Paid for general expenses	3,739 57
	$15,359 89

Liabilities.

Due for permanent improvements, salaries, taxes, etc.	$487 10
Due for unpaid premiums	525 50
Total	$1,012 60

Resources.

34,775 pounds of wheat in Stockton warehouse, at $1 50 per cental	$521 62
Due the association on accounts	77 00
Total	$598 62

J. M. LaRUE, Secretary.

LIST OF DONATIONS

To the San Joaquin Valley Agricultural Association up to and including the eleventh day of December, 1880.

J. B. Douglass	$20 00
James Cavin	25 00
Tourists' Restaurant	10 00
William McCurdy	5 00
Offer & Friedman	10 00
F. Wedekind	10 00
Steinhart Bros.	10 00
Haines & Snyder	10 00
Vienna Restaurant	5 00
F. C. Hahn (Commercial Hotel)	15 00
A. Peyser	2 50
Delano & Douglass	2 50
W. H. Keeler	2 50
Lothrop & Noble	2 50
H. J. Hughes (White House)	5 00
H. Marks	2 50
H. H. Hogan	2 50
J. W. England	2 50
Wasley & Saunders	2 50
Rohrbacher & Brutschy	5 00
William H. Smith	10 00
Marble & Shaver	5 00
Cadien & Bagley	5 00
Jesse A. Weaver	15 00
Hermann Bros.	5 00
D. B. Meller	2 50
E. Block	2 50
M. Caro	5 00
William H. Douglass	5 00
L. U. Shippee	111 00
J. K. Meyer	5 00
C. K. Bailey	10 00
W. A. Dorr	32 00
Matteson & Williamson	11 00
Grangers' Union	13 00
H. T. Dorrance	30 00
Sylvester & Maye	77 00
Total	$494 00

J. M. LaRUE, Secretary.

EXHIBITS AT THE FAIR—1880.

ENTRIES AT THE PARK.

FIRST DEPARTMENT—LIVE STOCK.

CLASS I.—THOROUGHBRED HORSES.

C. Halverson, Routier, Sacramento County—Seventeen years old, b. h. Bayswater, by Old Lexington; dam, Bay Leaf.
D. W. Bury, Stockton—Eleven years old, br. h. Partisan, by Tomahawk; dam, Lady Overton.
Chas. McLaughlin, Bantas—Three years old, s. h. Idle, by Wildidle; dam, Emma Barnes.
Chas. McLaughlin, Bantas—Two years old, b. h. Boots, by Hercules; dam, Emma Barnes.
N. W. Randall, Stockton—Two years old, br. h. Sun Dog, by Thad. Stevens; dam, by Hercules.
Chas. Murphy, San José—Yearling, b. h. Sam Boring, by Wildidle; dam, Mary Watson.
Samuel Miller, Stanislaus County—Suckling, s. c. Joe Daniels, Jr., by Joe Daniels; dam, Minnie Smith.
Judge D. S. Terry, Stockton—Suckling, s. c. Lara, by Joe Daniels; dam, Reveille.
Chas. Murphy, San José—Eight years old, b. m. Mary Watson, by imported Hercules; dam, by Independence.
N. W. Randall, Stockton—Seven years old, br. m. Sugar Plum, by Lodi; dam, by Sweetwater.
Samuel Miller, Stanislaus County—Sixteen years old, s. m. Minnie Smith, by Starlight; dam, Fanny Howard.
Samuel Miller, Stanislaus County—Three years old, s. m. Minta, by Joe Daniels; dam, Carrie Miller.
Samuel Miller, Stanislaus County—Fifteen years old, s. m. Carrie Miller, by Veto; dam, Fanny Howard.
Samuel Miller, Stanislaus County—Two years old, s. m. Ann McMullen, by Joe Daniels; dam, Minnie Smith.
Judge D. S. Terry, Stockton—Two years old, Lilly Ashe, by Joe Daniels; dam, Reveille.
C. M. Creanor, Stockton—Yearling, b. m. Lady Partisan, by Partisan; dam, Julia Matteson.
G. W. Trahern, Stockton—Yearling, s. m. Kate Carson, by Joe Daniels; dam, Belle Mahone.
Judge D. S. Terry, Stockton—Yearling, s. m. Tehama, by Joe Daniels; dam, Reveille.
Samuel Miller, Stanislaus County—Yearling, s. m. Lilo, by Joe Daniels; dam, Minnie Smith.
Chas. Murphy, San José—Suckling, br. f. Brown Kitty, by Bob Wooding; dam, Mary Watson.

CLASS II.—FAMILIES.

Samuel Miller, Stanislaus County—Sixteen years old, s. m. Minnie Smith and family.
Judge D. S. Terry, Stockton—Nine years old, Reveille and family.
Samuel Miller, Stanislaus County—Fifteen years old, s. m. Carrie Miller and family.
J. A. McCloud, Stockton—Chieftain and family.
Wm. Johnson, Grayson, California—Fanny Fern and family (five colts).
J. A. McCloud, Stockton—Beauty and family (three colts).

CLASS III.—HORSES FOR ALL WORK.

C. Halverson, Routier Post Office, Sacramento County—Five years old, ch. h. Franklin, by Old John Bull; dam, Belle.
John Pfau, Petaluma—Ten years old, b. h. Eureka, by Walnut Bark; dam, by Tom Bigsby.
T. B. Graves, Farmington—Seven years old, ch. h. Reuben Glenroy, by Corsica; dam by Pilgrim.
W. A. Munson, Dixon—Three years old, g. h. Dom Pedro, by Pedro; dam, by Kentucky Whip.
L. U. Shippee, Stockton—Ten years old, b. h. Henry Clay, by Dave Hill; dam, by Messenger.
J. A. McCloud, Stockton—Eight years old, b. h. Chieftain, Jr., by Chieftain; dam, by Ben Dragon.
T. Van Beckten, Woodbridge—Eight years old, b. h. Combination, by Vibrator; dam, Lady Niles.
Joel Merchant, Sonoma County—Six years old, b. h. George M. Patchen, by California Patchen; dam, Hollister Mare.

F. B. Clowes, Stockton—Five years old, b. h. Prairie Pride, by Monarch; dam, Chestnut Bird.
Wm. H. Douglass. Stockton—Two years old, b. h. George S. Evans, by Mohawk Chief; dam, Jennie Delano.
N. Harrison, Farmington—Two years old, br. h. Dick, by Joe Daniels; dam, Lucy.
B. E. Harris, San Francisco—Two years old, ch. h. Dividend, by Elmo; dam, Lady Silva.
F. B. Clowes, Stockton—Two years old, s. h. Dave, by Prairie Pride, by Lady Odd Fellow.
L. U. Shippee, Stockton—Yearling, b. c. No Name, by Nutwood; dam, Patchen Mare.
Wm. Johnson, Grayson—Yearling, blk. c. Fred. Arnold, by Nephew; dam, Fanny Fern.
Wm. Johnson, Grayson—Yearling, b. c. Pete, by Winthrop; dam, Lady Moscow.
Charles Howland, Stockton—Yearling, br. c. I. X. L., by Priam; dam, by Morgan Rattler.
B. E. Harris. San Francisco—Yearling, ch. c. Grenadier, by Brigadier; dam, Lena Bowles.
Judge D. S. Terry, Stockton—Yearling, blk. c. Zulu, by Blackbird; dam, by Rifleman.
George Schwartz, Stockton—Suckling, b. c. General Dana, Jr., by General Dana; dam, Fanny Main.
J. B. Harrelson, Waterloo—Suckling, s. c. Rowdy, by Young Chieftain; dam, by Corsica.
J. A. McCloud, Stockton—Suckling br. c. Judge P., by Nephew; dam, Daisy.
Thomas Cunningham. Stockton—Suckling, b. c., no name, by General Dana; dam. by Jinney.
B. F. Samuels, Lathrop—Suckling, b. c., no name, by General Dana; dam, by David Hill.
John Pfau, Petaluma—Three years old, b. m. Lizzie May, by Eureka; dam, unknown.
George Schwartz, Stockton—Seven years old, g. m. Fanny Main, by Silverside; dam, by Chieftain.
N. Harrison, Farmington—Four years old, br m. Kate, by Joe Daniels; dam, Lucy.
N. Harrison, Farmington—Three years old, b. m. Nelly Endich, by Joe Daniels; dam, unknown.
L. U. Shippee, Stockton—Four years old, b. m. Sacramento, by Chieftain; dam, unknown.
L. U. Shippee, Stockton—Six years old, b. m. Stockton, by Old Patchen; dam, unknown.
Charles McLaughlin, Bantas—Five years old, g. m. Fanny, by McClellan Duke; dam, a Messenger mare.
Charles McLaughlin, Bantas—Six years old, s. m. Minnie, by McClellan Duke; dam, Emma Barnes.
J. B. Harrelson, Waterloo—Eight years old, s. m. Molly Bright, by Corsica; dam, a Glencoe mare.
B. E. Harris, San Francisco—Eight years old, b. m. Lady Silva, by Whipple's Hambletonian; dam, by Belmont.
N. Harrison, Farmington—Two years old, b. m. Mollie Gibson, by Joe Daniels; dam, Molly.
John Visher, Modesto—Yearling, s. m. Baby Mine, by Guy Livingston; dam, unknown.
J. A. McCloud, Stockton—Yearling, b. m. Pet, by Chieftain; dam, Beauty.
B. E. Harris, San Francisco—Yearling, s. m. Emma Brown, by Pinole; dam, Belle Brown.
John Burns, Stockton—Yearling, br. m. Mountain Hare, by Priam; dam, by McCracken Blackhawk.
B. E. Harris, San Francisco—Suckling, ch. f. Agnes, by Cardinal; dam, unknown.
B. F. Samuels, Lathrop—Suckling, br. f. Lilla, by General Dana; dam, by Billy Hatch.

CLASS IV.—ROADSTERS.

John Vivian, Modesto—Eight years old, b. h. Ben. Franklin, by David Hill; dam, Nena Sahib.
J. W. Knox, San José—Ten years old, s. h. Nutwood, by Belmont; dam, Miss Russell.
Chas. McLaughlin, Bantas—Ten years old, ch. s. h. McClellan Duke, by Gen. McClellan; dam, Bertrand mare.
Walter E. Morris, Stockton—Seven years old, s. h. Priam, by Whipple's Hambletonian; dam, Revere.
Daniel Brown, Petaluma—Three years old, b. h. Jackson Temple, by Volunteer; dam, Alice Daniels.
L. U. Shippee, Stockton—Two years old, b. h. Hawthorne, by Nutwood; dam, by Volunteer.
J. A. McCloud, Stockton—Eleven years old, b. m. Daisy, by Chieftain; dam, Beauty.
D. McCarty, Oakland—Six years old, b. g. Hancock, by Whipple's Hambletonian; dam, Langford mare.
Thos. Cunningham, Stockton—Seven years old, s. g. Jinney, by Romulus; dam, by Ethan Allen.
L. U. Shippee, Stockton—Ten years old, b. g. Lightfoot, by Sherman Blackhawk; dam, by Young Belmont.
Alex. Chalmers, Stockton—Ten years old, b. m. Queen, by Morgan Rattler; dam, unknown.
Wm. Johnson, Grayson—Three years old, b. m. Libby B., by Winthrop; dam, Fanny Fern.
D. McCarty, Oakland—Three years old, b. m. Carrie F., by Erwin Davis; dam, a sister to Onward.
T. J. Young, Modesto—Two years old, b. g. Tom Young, by Partisan; dam, Rose.
S. P. Bailey, Stockton—Two years old, s. m. Belle, by Priam; dam, Chubb.
Wm. Johnson, Grayson—Two years old, b. m. Mollie J., by Wm. Cole; dam, Fanny Fern.
J. H. Dodge, Stockton—Two years old, ch. s. m. Clara D., by Priam; dam, by Chieftain.

MATCHED ROADSTERS.

Alex. Chalmers, Stockton—Two and three year old, blk. Billy and Fanny, by Priam; dam by Morgan Rattler.

N. Harrison, Farmington—Six year old, blk. Fred and Topsy, by Sherman Morgan; dam, unknown.

Wm. Johnson, Grayson—Nine and ten year old, s. Amy B., and b. Fanny Fern.

Chas. Dallas, Stockton—Five and six year old bays, by Gen. Dana and Morgan Rattler.

CLASS V.—DRAFT HORSES.

L. U. Shippee, Stockton—Three years old, b. h. Prince Consort, Jr., by Prince Consort; dam, Scotch mare.

Charles McLaughlin, Bantas—Twelve years old, b. h. General Grant, by imported Australian; dam, ditto.

George W. Voorhies, Collegeville—Ten years old, b. h. Monarch, by French Consort; dam, Planter mare.

George W. Voorhies, Collegeville—Yearling, b. c. Monarch, Jr., by Monarch; dam, Chestnut Bird.

George W. Voorhies, Collegeville—Suckling, br. c. Granger, by Monarch; dam, Polly Perkins.

C. K. Bailey, Linden—Suckling, blk. c. Starr King, by Patchen; dam, Lady Clyde.

O. B. Harvey, Rough and Ready Island—Six years old, br. m. Coaly, by Norman horse; dam, by Sherman Morgan.

C. K. Bailey, Linden—Six years old, b. m. Lady Clyde; sire, unknown; dam, a Sidney mare.

C. K. Bailey, Linden—Two years old, g. m. Calote Queen, by Duke de Chartres; dam, by Young Rollin.

C. K. Bailey, Linden—Yearling, g. f. Princess McDowell, by Duke de Chartres; dam by Young Rollin.

O. B. Harvey, Rough and Ready Island—Suckling, br. f. Dora, by Norman horse; dam, Coaly.

CLASS VI.—MATCHED CARRIAGE HORSES.

Jacob K. Meyer, Stockton—Four and five years old, blk. Reuben and Prince, by Morgan Rattler; dam, unknown.

Osmand Johnson, Modesto—Three and five years old, bay Lucy and mate, by Henry Clay and Priam; dam, Belmont mare.

J. A. McCloud, Stockton—Three years old, bay Tom and Zep, by Chieftain, Jr.

SINGLE BUGGY HORSES.

D. J. Oullahan, Stockton—Six years old, s. g. Bonanza, by General McClellan; dam, a McCracken mare.

H. D. C. Barnhart, Stockton—Seven years old, br. m. Jennie Hunter, by Kentucky Hunter; dam, by Jim Crow.

J. A. McCloud, Stockton—Seven years old, ch. g. Lieutenant, by McClellan; dam, unknown.

William Johnson, Grayson—Seven years old, g. m. Winthrop Maid, by Drew; dam, unknown.

D. McCarty, Oakland—Nine years old, b. m. Alice Garratt, by Reuben; dam, unknown.

SWEEPSTAKES.

C. Halverson, Routier, Sacramento County—Seventeen years old, b. h. Bayswater, by Old Lexington; dam, Bay Leaf.

J. W. Knox, San José—Ten years old, s. h. Nutwood, by Belmont; dam, Miss Russell.

J. A. McCloud, Stockton—Eight years old, b. h. Chieftain, Jr., by Chieftain; dam, by Ben. Dragon.

L. U. Shippee, Stockton—Ten years old, b. h. Henry Clay, by David Hill; dam, a Messenger mare.

David T. Creanor, Stockton—Five years old, b. m. Lilly Woodburn, by Woodburn; dam, Beauty.

J. A. McCloud, Stockton—Eleven years old, b. m. Daisy, by Chieftain; dam, Beauty.

B. E. Harris, San Francisco—Eight years old, b. m. Lady Silva, by Whipple's Hambletonian.

Chas. Murphy, San José—Eight years old, b. m. Mary Watson, by Imp. Hercules; dam, by Independence.

L. U. Shippee, Stockton—Seven years old, b. m. Lady Patchen, by Old Patchen; dam, unknown.

CLASS VII.—JACKS AND JENNETS.

Geo. S. Culberson, Capay, Yolo County—Six years old, black Kentucky Star.

W. A. Munion, Dixon, Solano County—Six years old, black John Henry, by imported Spanish Jack; dam, by Mammoth.

John C. White, Stockton—Five years old, black Kentucky Bill, by Sampson; dam, imported.

John C. White, Stockton—Two and one half years old br. g. Morgan.

W. F. Freeman, Stockton—Two years old, black Paris.

W. F. Freeman, Stockton—Five years old, black jennet Lexington.

CLASS IX.—DURHAM CATTLE.

Bulls.

C. Younger, San José—Six years old, red, Red Thorndale, by Thorndale; dam, Dolly.

Jesse D. Carr, Gabilan, Monterey County--Three years old, red, 11th Duke of Gabilan, by Hero of Riverbank; dam, Hope 23d.

C. Younger, San José—Two years old, red, 2d Duke of Alameda, by Master Maynard; dam, Rose of Summer 8th.

Chas. Clark, Milpitas, Santa Clara County—Two years old, red, Gwyne Prince, by Grand Prince of Lightburne; dam, Dame Gwyne.

Jesse D. Carr, Gabilan—Two years old, red, Independence, by 6th Duke of Gabilan; dam, Pet of Geneva.

C. Younger, San José—Yearling, red, 2d Red Thorndale, by Red Thorndale; dam, Dolly Thorndale.

Jesse D. Carr, Gabilan—Yearling, red, Oxford Beau, by 6th Duke of Gabilan; dam, Lady Oxford.

C. Younger, San José—Red roan calf, 16th Red Thorndale, by Red Thorndale; dam, 1st Golden Gate.

Charles Clark, Milpitas—Red calf, Ruby Prince, by Gwyne Prince; dam, Ruby 1st.

C. Younger, San José—Red calf, Maynard Duke, by 1st Duke of Alameda; dam, Jessie Maynard.

Jesse D. Carr, Gabilan—Red calf, 23d Duke of Gabilan, by 6th Duke of Gabilan; dam, Eulalie.

Charles Clark, Milpitas—Red calf, Duchess Prince, by Gwyne Prince; dam, Duchess of York 13th.

Jesse D. Carr, Gabilan—Red calf, 28th Duke of Gabilan, by 6th Duke of Gabilan; dam, Hope 27th.

Cows.

C. Younger, San José—Four years old, red, Dolly Thorndale, by Thorndale; dam, Dolly.

C. Younger, San José—Four years old, red roan, 2d Rose of Forest Home, by Thorndale; dam, Red Rose of Woodlawn.

C. Younger, San José—Four years old, red, 2d Rose of Avenue Ranch, by Master Maynard; dam, Belle Brent 6th.

C. Younger, San José—Five years old, roan, 1st Golden Gate, by Thorndale; dam, Golden Gate.

C. Younger, San José—Three years old, red, Red Dolly 2d, by Ardrie Thorndale; dam, Red Dolly.

Charles Clark, Milpitas—Six years old, roan, Duchess of York 15th, by Sheriff; dam, Duchess of York 9th.

Charles Clark, Milpitas—Six years old, red, Duchess of York 13th, by Sheriff; dam, Duchess of York 5th.

Charles Clark, Milpitas—Eight years old, red, Molly, by Rudolph; dam, Mayday.

Jesse D. Carr, Gabilan—Six years old, roan, Pet of Geneva, by 5th Duke of Geneva; dam, Marion.

Jesse D. Carr, Gabilan—Seven years old, red, Portubacca 2d, by Gen. Sheridan; dam, Portubacca.

Jesse D. Carr, Gabilan—Seven years old, red, Hope 22d, by Baron of Geneva; dam, Hope 3d.

Jesse D. Carr, Gabilan—Four years old, red, 3d Maid of Monterey, by Romeo; dam, Clara.

C. Younger, San José—Two years old, roan, Red Dolly 5th, by Thorndale; dam, Red Dolly.

Chas. Clark, Milpitas—Two years old, roan, Ruby 1st, by Sheriff; dam, Molly 1st.

Jesse D. Carr, Gabilan—Two years old, roan, Hope 27th, by Hero of Riverbank; dam, Hope 22d.

Jesse D. Carr, Gabilan—Two years old, roan, Fairy Queen 4th, by Duke of Mason; dam, Fairy Queen 2d.

Jesse D. Carr, Gabilan—Two years old, red, Gabilan Beauty, by 2d Duke of Gabilan; dam, Louan 44th.

C. Younger, San José—Yearling, red, 6th Rose of Forest Home, by Red Thorndale; dam, 2d Rose of Forest Home.

C. Younger, San José—Yearling, red, 6th Rosa Nell, by Red Thorndale; dam, 1st Rosa Nell.

C. Younger, San José—Yearling, red, Jessie Maynard 2d, by 1st Duke of Alameda; dam, Jessie Maynard.

Chas. Clark, Milpitas—Yearling, red, Ruby 4th, by Sheriff; dam, Mollie 1st.

Jesse D. Carr, Gabilan—Yearling, red and white, Fairy Queen 5th, by 6th Duke of Gabilan; dam, Fairy Queen 2d.

Jesse D. Carr, Gabilan—Yearling, roan, Lady Oxford 2d, by 6th Duke of Gabilan; dam, Pet of Geneva.

Jesse D. Carr, Gabilan—Yearling, red, 18th Maid of Monterey, by 6th Duke of Gabilan; dam, 3d Maid of Monterey.

Jesse D. Carr, Gabilan—Yearling, roan, 1st Belle of Gabilan Ranch, by 6th Duke of Gabilan; dam, Belle Morris.

C. Younger, San José—Red heifer calf, Red Dolly 6th, by Red Thorndale; dam, Dolly Thorndale.

C. Younger, San José—Red heifer calf, Red Dolly 7th, by Red Thorndale; dam, Red Dolly 2d.

C. Younger, San José—Red heifer calf, 7th Rose of Forest Home, by Red Thorndale; dam, Red Rose of Woodlawn.

C. Younger, San José—Red heifer calf, Oxford Rose 3d, by Red Thorndale; dam, Oxford Rose.

Jesse D. Carr, Gabilan—Red and white heifer calf, 19th Maid of Monterey, by 6th Duke of Gabilan; dam, 12th Maid of Monterey.

Jesse D. Carr, Gabilan—Red and white heifer calf, 20th Maid of Monterey, by 6th Duke of Gabilan; dam, 3d Maid of Monterey.

CLASS XI.—JERSEY AND ALDERNEY CATTLE.

Bulls.

Henry Pierce, San Francisco—Three years old, Hugo of Yerba Buena.

S. B. Kingsley, Stockton—Two years old, Toronto, by Keystone 2d; dam, Fanny.

S. B. Kingsley, Stockton—Yearling, Oliver, by Hero; dam, Olive 3d.

S. B. Kingsley, Stockton—Calf, Hero 2d, by Hero; dam, Olive 3d.

Henry Pierce, San Francisco—Yearling calf, —— of Yerba Buena.

Cows.

S. B. Kingsley, Stockton—Eight years old, Olive 3d, by Prince of Wales; dam, Olive.

Henry Pierce, San Francisco—Eight years old, Pearl 2d of Yerba Buena, by Raulston; dam, Pearl.

Henry Pierce, San Francisco—Six years old, Eva of Yerba Buena, sire imported from Isle of Jersey.

S. B. Kingsley, Stockton—Two years old, Fawn, Olive 4th, by Touchstone, by Olive 3d.

Henry Pierce, San Francisco—Two years old, Mignonette, of Yerba Buena; sire imported from Isle of Jersey.

Henry Pierce, San Francisco—Two years old, Coquette, of Yerba Buena; sire imported from Isle of Jersey.

Henry Pierce, San Francisco—Two years old, Fairy, of Yerba Buena; sire imported from Isle of Jersey.

Henry Pierce, San Francisco—Two years old, Montplaisier, of Yerba Buena; sire imported from Isle of Jersey.

Henry Pierce, San Francisco—Two years old, Beauty, of Yerba Buena; sire imported from Isle of Jersey.

Henry Pierce, San Francisco—Yearling, Annie Cary, of Yerba Buena, by imported Victor, of Yerba Buena; dam, Alderney Queen 4th.

Henry Pierce, San Francisco—Calf, Sycamore, of Yerba Buena, by imported Victor, of Yerba Buena; dam, Minnie 4th of Yerba Buena.

S. B. Kingsley, Stockton—Calf, Jennie, by Toronto; dam, Olive 4th.

CLASS XII.—AYRSHIRE CATTLE.

Bulls.

George Bement, Redwood City, San Mateo County—Seven years old, brown and white, Melancthon Callaghan, by Heber Kimball, 605 A. R.; dam, Kitty Clyde, 530 A. R.

George Bement, Redwood City, San Mateo County—Yearling, red and white, Archie, by Adonis, 2089 A. R.; dam, Linda 2d, 2739 A. R.

Cows.

George Bement, Redwood City—Twelve years old, Maggie, sire and dam imported.

George Bement, Redwood City—Ten years old, Lady Chapin, 1402 A. R., by McDonald, 260 A. R.; dam, Brenda, 28 A. R.

George Bement, Redwood City—Four years old, Stelita, 4518 A. R., by Hiram, 1194 A. R.; dam, Stella, 3305 A. R.

George Bement, Redwood City—Two years old, Stellina, 4519 A. R., by Scarboro Chief, 1706; dam, Young Stella, 3305 A. R.

George Bement, Redwood City—Yearling, Highland Maid, by Melancthon Callaghan; dam, Highland Lassie.

SWEEPSTAKES.

Bulls.

C. Younger, San José—Six years old, red, Red Thorndale, by Thorndale; dam, Dolly.

C. Younger, San José—Two years old, red, 2d Duke of Alameda, by Master Maynard; dam, Rose of Summer 8th.

C. Younger, San José—Yearling, red, 7th Red Thorndale, by Red Thorndale; dam, Dolly Thorndale.

Charles Clark, Milpitas—Two years old, red, Gwyne Prince, by Grand Prince of Lightburne; dam, Dame Gwyne.

Jesse D. Carr, Gabilan—Three years old, red, 11th Duke of Gabilan, by Hero of Riverbank; dam, Hope 23d.

Jesse D. Carr, Gabilan—Two years old, red, Independence, by 6th Duke of Gabilan; dam, Pet of Geneva.

S. B. Kingsley, Stockton—Two years old, Toronto, by Keystone 2d; dam, Fanny.

Cows.

C. Younger, San José—Three years old, red, Red Dolly 2d, by Red Thorndale; dam, Red Dolly.

C. Younger, San José—Four years old, roan, 2d Rose of Forest Home, by Thorndale; dam, Red Rose of Woodlawn.

C. Younger, San José—Five years old, roan, 1st Golden Gate, by Thorndale; dam, Golden Gate.

C. Younger, San José—Four years old, red, Dolly Thorndale, by Thorndale; dam, Dolly.

C. Younger, San José—Yearling, red, 6th Rose of Forest Home, by Red Thorndale; dam, 2d Rose of Forest Home.

Chas. Clark, Milpitas—Six years old, roan, Duchess of York 15th, by Sheriff; dam, Duchess of York 9th.

S. B. Kingsley, Stockton—Eight years old, Olive 3d, by Prince of Wales; dam, Olive.

Jesse D. Carr, Gabilan—Seven years old, roan, Pet of Geneva, by 5th Duke of Geneva; dam, Maria.

Jesse D. Carr, Gabilan—Seven years old, red, Portubacca 2d, by General Sheridan; dam, Portubacca.

Jesse D. Carr, Gabilan—Two years old, roan, Fairy Queen 4th, by Hero of Riverbank; dam, Fairy Queen 3d.

Jesse D. Carr, Gabilan—Four years old, red, 3d Maid of Monterey, by Romeo; dam, Clara.

Henry Pierce, San Francisco—Eight years old, Pearl 2d of Yerba Buena, by Raulston; dam, Pearl.

Henry Pierce, San Francisco—Six years old, Eva of Yerba Buena; sire and dam imported from Isle of Jersey.

HERDS OF CATTLE—OLD HERDS.

C. Younger, San José—Red Thorndale, bull; Dolly Thorndale, Red Dolly 2d, 2d Rose of Forest Home, 2d Bell of Avenue Ranch, First Golden Gate, cows.

Jesse D. Carr, Gabilan—11th Duke of Gabilan, bull; Pet of Geneva, Portubacca, Hope 22d, 3d Maid of Monterey, Fairy Queen 4th, cows.

George Bement, Redwood City—Melancthon Callaghan, bull; Maggie, Lady Chapin, Stellita, Stellina, Highland Maid, cows.

YOUNG HERDS.

C. Younger, San José—7th Red Thorndale, bull; 6th Rose of Forest Home, 6th Rosa Nell, 7th Rose of Forest Home, Jessie Maynard 2d, cows.

Jesse D. Carr, Gabilan—Oxford Beau, bull; Fairy Queen 5th, Lady Oxford 2d, 18th Maid of Monterey, 1st Belle of Gabilan Ranch, cows.

SPECIAL ENTRIES.

K. W. Jones, Huron, Tulare County—Seven years old, red steer, Dick.

GUERNSEY CATTLE.

Henry Pierce, San Francisco—Six years old cow, Monica of Yerba Buena, imported from Isle of Guernsey.

Henry Pierce, San Francisco—Two years old cow, Fanny of Yerba Bueha, imported from Isle of Guernsey.

Henry Pierce, San Francisco—Two years old cow, Daisy of Yerba Buena, imported from Isle of Guernsey.

AYRSHIRE CATTLE.

George Bement, Redwood City—Eight months old bull, Eclipse, by Scarboro Chief, 1706, A. R.; dam, Linda 3d, 3624, A. R.

George Bement, Redwood City—Seven months old heifer, Marietta, by Adonis, 2089, A. R.; dam, Miriam, 2905, A. R.

SHEEP.

Cotswold.

C. Younger, San Jose—Ram, Far West.

C. Younger, San Jose—One pen, five ewes, one year old and upward.

Sweepstakes.

C. Younger, San José—Rams, Far West, General Hancock, and Long Fleece.

SWINE.

M. D. Boruck, Staten Island—Two years old, black Berkshire boar, Black Prince of Linden, by imported Earl of Saint Bridge and imported Belladonna's niece.

M. D. Boruck, Staten Island—Two years old, black Berkshire sow, Hattie of Linden, by Hillsmere and Prima Donna 3d.

M. D. Boruck, Staten Island—Sow, Hattie of Linden and three pigs, viz: Queen Bess, Mollie, and Richard.

THIRD DEPARTMENT.

MACHINERY, ETC.

Adams, Gerowe & Co., Stockton—One harrow.
Sherrill Plow Company—One harrow.
Sherrill Plow Company—One large cultivator.
Sherrill Plow Company—One seed sower.
Sherrill Plow Company—One gang plow.
J. S. Haines, Stockton—One harrow.
S. B. Bowen, Stockton—One and five eighths inch sulky gang plow.
Abbot & Williams, Stockton—One windmill "Relief."
Lewis Clark, Stockton—One grain separator.
Matteson & Williamson, Stockton—One fourth gang, eight-inch plow.
Matteson & Williamson, Stockton—One third gang, ten-inch plow.
Matteson & Williamson, Stockton—One nine-tooth cultivator.
Matteson & Williamson, Stockton—One A. C. sulky plow.
Matteson & Williamson, Stockton—One one fourth section harrow.
Matteson & Williamson, Stockton—One four set stretchers.
Matteson & Williamson, Stockton—One grain truck.
Matteson & Williamson, Stockton—One single plow.
Matteson & Williamson, Stockton—One road scraper.
Matteson & Williamson, Stockton—One horse rake.
Matteson & Williamson, Stockton—Two spring harrows.
Matteson & Williamson, Stockton—One two-horse harrow.
Matteson & Williamson, Stockton—One four-horse harrow.
W. G. Phelps, Stockton—One mammoth road scraper and open ditch plow.
Wm. A. Dorr & Co., Stockton—One Buckeye force feed drill.
Wm. A. Dorr & Co., Stockton—One ten-inch John Deere sulky plow.
Wm. A. Dorr & Co., Stockton—One Buckeye sulky plow.
Wm. A. Dorr & Co., Stockton—One fourteen-inch barley mill.
Wm. A. Dorr & Co., Stockton—One Dorr improved gang plow.
Wm. A. Dorr & Co., Stockton—One Cahoon seed sower.
Wm. A. Dorr & Co., Stockton—One Buckeye cider press.
Wm. A. Dorr & Co., Stockton—One wine press and mill.
Wm. A. Dorr & Co., Stockton—Two Burdick's hay cutters.
Wm. A. Dorr & Co., Stockton—One saw machine.
Wm. A. Dorr & Co., Stockton—One John Deere single plow.
Wm. A. Derr & Co., Stockton—One John Deere single plow No. 80.
Wm. A. Dorr & Co., Stockton—One John Deere single plow No. 58.
Wm. A. Dorr & Co., Stockton—One John Deere single plow No. 7½.
Wm. A. Dorr & Co., Stockton—Three John Deere single plows No. 7.
Wm. A. Dorr & Co., Stockton—Two J. D. single plows.
Wm. A. Dorr & Co., Stockton—Two J. D. single plows No. 6.
Wm. A. Dorr & Co., Stockton—One Buckeye N. M. mower.
Wm. A. Dorr & Co., Stockton—One sulky plow.
Wm. A. Dorr & Co., Stockton—One Veteran cornsheller.
Wm. A. Dorr & Co., Stockton—One advanced cultivator.
Wm. A. Dorr & Co., Stockton—One twelve-inch lawn mower.
Wm. A. Dorr & Co., Stockton—One thermometer churn.
Wm. A. Dorr & Co., Stockton—One Keystone two-horse corn planter.
Wm. A. Door & Co., Stockton—Two Champion fan mills.
Wm. A. Dorr & Co., Stockton—Four spools Glidden barb wire.
Wm. A. Dorr & Co., Stockton—One Schuttler spring wagon.
Grangers' Union of San Joaquin Valley, Stockton—One Ladaw revolving harrow.
Grangers' Union of San Joaquin Valley, Stockton—One Gorham seed sower.
Grangers' Union of San Joaquin Valley, Stockton—One fifth-gang eight-inch Granger plow.
Grangers' Union of San Joaquin Valley, Stockton—One fourteen-inch single plow, sulky attached.
Grangers' Union of San Joaquin Valley, Stockton—One Hill's Eureka three-gang sulky plow.
Grangers' Union of San Joaquin Valley, Scockton—One Hill's Eureka two-gang sulky plow.
Grangers' Union of San Joaquin Valley, Stockton—One Garden City two-gang sulky plow.
Grangers' Union of San Joaquin Valley, Stockton—One three-horse hollow tooth harrow.
Grangers' Union of San Joaquin Valley, Stockton—One beet seed sower (Gem).
Grangers' Union of San Joaquin Valley, Stockton—One seed sower (Gem).
Grangers' Union of San Joaquin Valley, Stockton—One Cahoon seed sower.
Grangers' Union of San Joaquin Valley, Stockton—One Little Chieftain fanning mill.
Grangers' Union of San Joaquin Valley, Stockton—One No. 2 Little Chieftain fanning mill.
Grangers' Union of San Joaquin Valley, Stockton—One No. 3 Sweepstakes wheelbarrow.
Grangers' Union of San Joaquin Valley, Stockton—One cast steel plow.
Grangers' Union of San Joaquin Valley, Stockton—One chilled plow.

Grangers' Union of San Joaquin Valley, Stockton—One Diamond chilled plow.
Grangers' Union of San Joaquin Valley, Stockton—One Clipper chilled plow.
Grangers' Union of San Joaquin Valley, Stockton—One patent pulverizer.
Grangers' Union of San Joaquin Valley, Stockton—One Sweepstakes iron harrow.
Grangers' Union of San Joaquin Valley, Stockton—One Sweepstakes improved five-gang ten-inch plow.
Wm. A. Dorr, Stockton—One Jackson patent light weight derrick fork.
Wm. A. Dorr, Stockton—One Taylor self-dumping horse rake.
Jos. H. Hansel, Stockton—One buckboard.
John Caine, Stockton—One Studebaker wagon.
John Caine, Stockton—One two-inch Nevada gear wagon.
John Caine, Stockton—One thimble skein gear wagon.
John Caine, Stockton—One spring wagon.
Wm. A. Dorr, Stockton—One two-inch Schuttler iron axle wagon (California rack bed).
Grangers' Union of San Joaquin Valley, Stockton—One Bain two-inch iron axle farm wagon.
Grangers' Union of San Joaquin Valley, Stockton—One two and one-half inch Sweepstake iron freight wagon.
Grangers' Union of San Joaquin Valley, Stockton—One one-seat Eastern spring wagon.
Grangers' Union of San Joaquin Valley, Stockton—One Sweepstake top spring wagon.
Grangers' Union of San Joaquin Valley, Stockton—One No. 00 Sweepstake one-seat open spring wagon.
Grangers' Union of San Joaquin Valley, Stockton—One Eastern express wagon.
Grangers' Union of San Joaquin Valley, Stockton—One Eastern platform wagon.
Grangers' Union of San Joaquin Valley, Stockton—One two-inch Sweepstake iron farm wagon.
Wm. A. Dorr & Co., Stockton—One 4-inch Rumsey pump.
Wm. A. Dorr & Co., Stockton—One 7-inch Rumsey pump.

ENTRIES AT THE PAVILION.

F. J. Corcoran, Stockton—Two water color drawings.
F. J. Corcoran, Stockton—One crayon drawing.
Kate Kinney, Stockton—One crochet spread.
Charles Dallas, Stockton—Fifty pounds of wheat, raised at Turlock.
C. R. Ralph, Stockton—Tarantula, Byron Springs.
Eugenie Coffier, Stockton (R. J. Coffier, exhibitor)—Porcelain painting.
Eugenie Coffier, Stockton (R. J. Coffier, exhibitor)—Two cups and saucers.
Eugenie Coffier, Stockton (R. J. Coffier, exhibitor)—Wreath of wax flowers.
Eugenie Coffier, Stockton (R. J. Coffier, exhibitor)—Hair flowers.
Eugenie Coffier, Stockton (R. J. Coffier, exhibitor)—Hair jewelry.
Eugenie Coffier, Stockton (R. J. Coffier, exhibitor)—Display of crocheting.
Eugenie Coffier, Stockton (R. J. Coffier, exhibitor)—Tatting handkerchiefs.
Eugenie Coffier, Stockton (R. J. Coffier, exhibitor)—Mat.
Eugenie Coffier, Stockton (R. J. Coffier, exhibitor)—Cushion.
Eugenie Coffier, Stockton (R. J. Coffier, exhibitor)—Darned net.
Eugenie Coffier, Stockton (R. J. Coffier, exhibitor)—Crochet apron, with cape.
Dr. A. G. Scott, San Francisco—Russian polish.
E. B. Stone, Stockton—Pen drawings and penmanship.
Katie Ward, Stockton—Hair wreath.
J. Q. Grinnell, Stockton—Three pictures.
Mrs. J. E. Boyce—Worsted embroidery.
Mrs. J. E. Boyce—Silk embroidery on silk.
Mrs. J. E. Boyce—Silk embroidery on woolen.
Mrs. J. E. Boyce—Cotton embroidery.
Mrs. J. E. Boyce—Patchwork quilt.
Mrs. J. E. Boyce—Three pieces of tatting.
Mrs. J. E. Boyce—Baby dress.
Mrs. J. E. Boyce—One baby dress and baby carriage afghan.
Mrs. J. E. Boyce—Bead work.
Mrs. J. E. Boyce—Needle work.
Mrs. F. Stewart, Stockton—One ottoman cover.
Mrs. F. Stewart, Stockton—One door rug.
Mrs. F. Stewart, Stockton—One lace bedspread.
Mrs. F. Stewart, Stockton—One piece of lace.
Mrs. F. Stewart, Stockton—Twelve mats.
Mrs. F. Stewart, Stockton—One tidy crochet.
Bessie Stewart—Five oil paintings.

Dr. Thomas Hall, San Francisco—Large exhibit of Pepsin wine bitters.
J. M. Ladd, Stockton—Soft and hard shell almonds.
F. C. Ferris, San Francisco—One beef shaver.
F. C. Ferris, San Francisco—One vegetable slicer.
F. C. Ferris, San Francisco—One twine cutter.
Mrs. G. S. Allard, Stockton—Two oil paintings.
Mrs. G. S. Allard, Stockton—Three water colors.
J. P. Spooner, Stockton—Nine colored crayon drawings.
J. P. Spooner, Stockton—Six black crayon drawings.
J. P. Spooner, Stockton—Two black crayon drawings of steamers.
J. P. Spooner, Stockton—Six framed photographic works, assorted sizes and styles.
Mrs. E. H. Moss, Stockton—One piece of netting.
Mrs. E. H. Moss, Stockton—Woolen garters.
Henry Heilwegen, San Francisco—One knuckle roller washing machine.
Henry Heilwegen, San Francisco—One corn and pumpkin seed planter.
Henry Heilwegen, San Francisco—One apple parer, corer, and divider.
Henry Heilwegen, San Francisco—Sample of German green salve.
H. T. Dorrance, Stockton—One set of double carriage harness.
H. T. Dorrance, Stockton—One set of single harness.
H. T. Dorrance, Stockton—One Mexican saddle.
H. T. Dorrance, Stockton—Saddles and bridles.
Sadie Sumerville, Stockton—Three pieces of needlework. Exhibitor under sixteen years of age.
May Sumerville—Crochet lamp mat.
May Sumerville—One lamp mat.
May Sumerville—One sofa pillow.
May Sumerville—Braid work.
May Sumerville—Silk embroidery on woolen.
May Sumerville—One piece of plain embroidery.
Sadie Sumerville—Two tidies.
Mrs. C. J. Smith, Stockton—Crochet display.
C. P. Troit—Landscape painting in oil.
Mrs. M. T. Noyes—Wax flower wreath.
Miss Maggie Andrews—Two landscape paintings in oil.
Miss Maggie Andrews—Two ivorytype paintings.
Miss Maggie Andrews—One water color painting on silk.
Miss Jennie Andrews—One worsted lamp mat.
Miss Jennie Andrews—One piece silk embroidery on woolen.
Miss Jennie Andrews—Lace work.
Mrs. J. H. Andrews, Stockton—Worsted embroidery on cotton.
Mrs. J. B. Harelson, Stockton—One piece patchwork.
Mrs. D. Odell—One piece of patchwork.
Mrs. D. Odell—One piece of quilting.
Mrs. D. Odell—Braided pillow and sheet shams.
Harry Weiner, San Francisco—Fifty green canary birds.
Mrs. Bouche—Basket worsted flowers.
Mrs. Bouche—Two crochet lamp mats.
Mrs. Bouche—Two pieces crochet.
Mrs. Bouche—One crochet mantle.
Mrs. Bouche—Two silk embroidered cushions.
Mrs. Bouche—One piece lace.
Mrs. Bouche—One crochet tidy.
Mrs. Bouche—Needlework.
Mrs. Bouche—Bead work.
Mrs. Bouche—Sofa pillow.
Mrs. Thomas Eckstrom, Stockton—One case fashionable millinery.
Mrs. Bouche—Toilet sets.
Ruhl & Floyd, Stockton—Collection of stoves.
Miss West, Stockton—Painting of flowers in water colors.
Miss West, Stockton—Three specimens of porcelain painting.
Miss West, Stockton—One specimen painting on wood.
George West & Co., Stockton—Sweet wines—Six bottles of Frontignau, vintage of 1877; six bottles of port, vintage of 1876; six bottles of angelica, vintage of 1877; six bottles of Vino de Oro, vintage of 1878.
George West & Co., Stockton—Dry wines—Six bottles claret, Zinfandel, vintage of 1878; six bottles white, Riesling, vintage of 1876; six bottles white, Zinfandel, vintage of 1878.
George West & Co., Stockton—Special wines—Six bottles Maderia, vintage of 1873; six bottles of sherry, vintage of 1872; six bottles of blackberry, vintage of 1878; six bottles of cherry brandy, 1878.
George West & Co., Stockton—Brandies—Six bottles of Heisling brandy, 1876; six bottles El Pinal, 1876.
Mrs. A. A. Fogg, Stockton—Two specimens of chenille work embroidery.
Mrs. Joseph Hale, Stockton—Fifty jars of fruit in sugar.

Mrs. Joseph Hale, Stockton—Forty-five glasses of jelly.
Mrs. Joseph Hale, Stockton—Seventeen jars of sweet and sour pickles.
Mrs. Joseph Hale, Stockton—Ten jars of fruit in brandy.
Mrs. Joseph Hale, Stockton—One Autumn leaf wreath.
Mrs. Joseph Hale, Stockton—One sea moss picture.
Mrs. Joseph Hale, Stockton—Sea moss album.
Mrs. Joseph Hale, Stockton—One flower work picture.
Mrs. Joseph Hale, Stockton—One toilet set.
Mrs. Joseph Hale, Stockton—One tidy.
Mrs. Florence Bugbee, Stockton—One lace pillow sham.
Miss Lulu Nichols, six years of age—One piece of patchwork.
Mrs. M. Scalerandi, Stockton—Three pieces of rag carpet.
Lothrop & Noble, Stockton—Case of hats and caps.
Mrs. O. B. Mosher, Stockton—One piece of patchwork.
Mrs. Kuferdorf—One piece of patchwork.
Mrs. J. C. Reid—Twelve glasses of jelly.
Geodfry Smith, aged fifteen years, Stockton—Map of California, map of South America, map of Africa.
Mrs. A. A. Fogg, Stockton—Wreath of Autumn leaves and hyacinth wax flowers.
Mrs. A. A. Fogg, Stockton—One specimen of worsted flowers.
Mrs. A. A. Fogg, Stockton—One worsted tidy.
Miss Lena Slaughter—Door mat.
Geodfry Smith—Sample of lettering.
Miss Nellie Smith—Three tidies.
Miss Nellie Smith—One toilet set.
Mrs. M. Cottle—Two pillow shams.
Mrs. M. Cottle—Specimen of needle work.
Mrs. Jas. Tatterson—One door rug.
Mrs. Jas. Tatterson—Two crochet lamp mats.
Mrs. Jas. Tatterson—Embroidery on lace.
Mrs. Dennis Vischer—Crochet work, tidies.
Miss Ada Goodell—Two specimens of darning.
Miss Mary Gallagher—Patchwork quilting.
Gus Gampertz—One baby carriage afghan.
Buhach Producing and Manufacturing Company—Display of insect powder.
Buhach Producing and Manufacturing Company—Display of insufflators.
C. V. Thompson—Assortment of vegetables and fruit.
I. N. Hoag—Cranberry plant.
H. T. Dorrance—Display of harness and saddlery.
H. G. Boisselier—Yeast powder.
John Doak—Map drawing.
Mrs. J. W. Hart—Needlework.
Mrs. J. W. Hart—Lace.
Mrs. J. W. Hart—Patchwork.
Mrs. J. W. Hart—Silk embroidery on woolen.
Mrs. J. W. Hart—Tatting.
Mrs. J. W. Hart—Knitting.
Sylvester & Moye—Three bedroom sets.
Sylvester & Moye—Four parlor sets.
Sylvester & Moye—One sofa.
Sylvester & Moye—Three lounges.
Sylvester & Moye—One writing desk.
Sylvester & Moye—Two mattresses.
Sylvester & Moye—Fifteen chairs and rocker.
Sylvester & Moye—One hall stand.
Sylvester & Moye—Upholstery.
Sylvester & Moye—Carpets and oilcloth.
Sylvester & Moye—One dressing bureau.
Sylvester & Moye—Extension table.
Sylvester & Moye—Bedroom furniture.
Sylvester & Moye—Grand piano.
Sylvester & Moye—Parlor piano.
Sylvester & Moye—Center table.
Sylvester & Moye—One musical instrument.
Mrs. Wm. Robinson—Silk patch quilt.
Mrs. J. W. Hart—Hemstitching.
Mrs. Wells—Embroidery on lace.
Mrs. J. E. Boyce—Embroidery on lace.
Mrs. Bates—Jar of peaches in brandy.
Mrs. Bates—Worsted embroidered tidy.
J. H. Andrews—Horse collars, home manufacture.
J. H. Andrews—Closed top Scotch collar.

J. H. Andrews—One pipe.
J. H. Andrews—Four Boston team collars.
J. H. Andrews—Two patent leather K collars.
J. H. Andrews—One mammoth lash.
Mrs. O. F. Cook—Steel engraving, medley.
E. A. Baird—Pianos, organs, etc.
J. R. Williams—Dr. J. Elliott's family and horse liniment.
J. R. Williams—Little's fever and ague cure.
J. R. Williams—National cough syrup.
J. R. Williams—Mexican insect powder.
J. R. Williams—Porterfield's sarsaparilla.
J. R. Williams—Extract ginger.
J. R. Williams—Hoof ointment.
Miss Flora Bell—Lace needlework.
Miss Nettie O. Bailey—Three tidies.
Miss Nettie O. Bailey—Needlework.
Miss Nettie O. Bailey—Two worsted embroidery.
Miss Addie M. Bailey—Crochet work.
Miss Lizzie W. Hale, Stockton—Basket of figs.
Mrs. J. W. Hart, Stockton—Wreath of feather flowers.
Miss Addie M. Bailey, twelve years of age—Wheat bread.
E. S. Holden, San Francisco—Sample of Holden's etherial cough syrup.
A. J. Woods—Corn in the ear.
Mrs. S. W. Sperry—Collection of grapes.
Fred. Hahn—A huge grasshopper.
Hermann Brothers—Chicago bottled beer.
Hermann Brothers—Budweiser beer.
Geo. West—Thirty-two varieties of grapes, viz.: Sherez, White Malaga, Ferrara, Black Morocco, Seedless Sultana, Muscat of Alexandria, Syrian, Black Hamburg, Flame Tokay, Zinfandel, Lombardy, De la Palestine, Isabella, Mission, Burgundy, Black St. Peter, Black Frontignon, White Tokay, Charbonniere, Zabebo, Gray Riesling, White Riesling, Froling Riesling, Tintura, Damascus, Dischia, Burger, Olive, White Nice, Johannesburg Riesling, Moselle Riesling, and Trosseau.
Mrs. Bruche—Moss lamp mat.
Miss Laura Trahern—Portrait painting.
Miss Juliet Belding—Lace work.
Mrs. C. J. Smith—Dried figs.
Steinhart Brothers—Boots and shoes.
Steinhart Brothers—Clothing and fancy goods.
Miss Hattie A. Keep—Oil painting.
George F. Eckstrom—Sewing machines, and a variety of work on same.
Mrs. E. Arrivey—Patchwork.
J. E. Wood—Sewing machines.
J. Dormer—Sewing machines.
Mrs. N. M. Littlehale—Two paintings.
J. C. Gage—Model windmill.
William Christopher—Twenty-five pound firkin of butter.
Mrs. A. A. Fogg—Patchwork.
Miss S. C. Dorrance—Case of coins.
Mrs. H. T. Dorrance—Two specimens of art.
California Paper Company—Twelve bundles printing paper, assorted sizes; one roll, fifteen reams.
California Paper Company—Two hundred reams wrapping paper.
Samuel Miller, Stanislaus—Samples of cheese.
Herbert Lyons—One box dried plums.
Herbert Lyons—One box dried peas.
Herbert Lyons—Samples of pears and quinces.
Mrs. I. R. Wilbur—Four rag mats.
Mrs. J. C. Reid—Twelve jars of fruit in sugar.
Mrs. J. C. Reid—Five jars of fruit in spirits.
Mrs. J. C. Reid—Five jars pickles.
Mrs. J. C. Reid—Forty-eight glasses of jelly.
Mrs. J. C. Reid—Family machine sewing.
Mrs. J. C. Reid—Knit stockings.
Mrs. J. C. Reid—Specimens of sewing.
Mrs. J. C. Reid—Dried apricots.
Robert Reid—Samples of figs.
Miss Mary Allen—Embroidery.
Miss Mary Allen—Silk embroidery on silk.
Miss Mary Allen—Silk embroidery on woolen.
Miss Mary Allen—Silk embroidery on cotton.
Miss Mary Allen—Crochet work.

Miss Mary Allen—Specimen of sea moss.
Joseph Hale—Assortment of vegetables.
Miss Nellie Plzenger—Framed wreaths of flowers.
Miss Lide H. Hickman—Jelly cake.
John G. Gilgert—Grapes.
Mrs. S. W. Sperry—Worsted embroidery.
Insane Asylum—Collection of vegetables.
T. S. Clark & Company—Gaspipe bedstead, with one woven wire mattress attached.
J. S. Clark & Company—Three woven wire mattresses.
J. S. Clark & Company—One hotel cot.
J. S. Clark & Company—One sick couch and chair.
J. S. Clark & Company—Folded parlor bed.
Mrs. J. C. Reid—One gents' shirt.
Mrs. J. C. Reid—Samples of dried figs.
Mrs. J. R. Williams—Worsted embroidery.
Mrs. J. R. Williams—Silk embroidery on woolen.
Mrs. J. R. Williams—One ottoman cover.
Mrs. J. R. Williams—One vase of wax flowers and cross.
Mrs. J. R. Williams—One specimen of lace.
Mrs. A. W. Simpson—Three glove boxes, Oregon wood.
Mrs. A. W. Simpson—Two match safes.
Mrs. A. W. Simpson—Punch bowl.
Mrs. A. W. Simpson—Cup and saucer.
Mrs. A. W. Simpson—Wine glass.
Mrs. A. W. Simpson—Card receiver.
Mrs. A. W. Simpson—Plate.
Mrs. A. W. Simpson—Napkin ring.
Mrs. A. W. Simpson—Ten napkin rings.
F. Wedekind—Lager beer from Albany brewery, San Francisco.
F. Wedekind—Buck beer, bottled and in keg.
Geo. H. Fuller—Eight school desks.
Geo. H. Fuller—One folding settee.
Geo. H. Fuller—Two store stools.
Geo. H. Fuller—Showcase fancy goods.
H. H. Moore & Son—H. H. H. medicine.
H. H. Moore & Son—Dr. Hawley's ague remedy.
H. H. Moore & Son—Tonic bitter condition powders.
H. H. Moore & Son—Burnham's abietine.
W. M. Hickman—Dr. Hawley's balsam.
W. M. Hickman—Green ginger brandy.
W. M. Hickman—Toilet articles.
N. B. Jenks—Two windmill models.
E. J. Smith—New California fruit dryer.
E. J. Smith—Dried figs.
E. J. Smith—Dried peaches.
E. J. Smith—Dried pears.
E. J. Smith—Dried apples.
E. J. Smith—Dried vegetables.
M. M. Nichols—Moose horn.
Stewart & Smith—One sack Chile wheat.
Stewart & Smith—One sack Proper.
Dr. R. K. Reid—Three dishes oranges.
Dr. R. K. Reid—Two dishes pomegranates.
J. R. Williams—Oriental hair tonic.
J. R. Williams—Williams' Florida water.
J. R. Williams—Williams' opalescent cologne.
J. R. Williams—Williams' beef, iron and wine.
J. R. Williams—Williams' tooth powder.
Wm. Graham—Plate of apples, from Iowa.
Wm. Graham—Two willow twigs.
Wm. Graham—One Iowa peach.
Wm. Graham—One plate corn.
Wm. Graham—One plate shell-bark hickory nuts.
Wm. Graham—One plate hazel nuts, from Michigan and Illinois.
Mrs. R. S. Bates—Collection of plants.
Mrs. R. S. Bates—One new and rare plant.
Mrs. R. S. Bates—Fuchsias in bloom.
Mrs. R. S. Bates—Display of hanging baskets.
John Clifford—Specimen of model work.
Wm. Graham—Case of hardware.
Jacob Meyers—Collection of grapes.
T. J. Murray—(Insane Asylum)—Specimen castor bean.

B. N. Armington—Rio coffee plant.
D. Cameron—Collection of plants.
D. Cameron—Hanging baskets.
D. Cameron—Ornamental grasses.
D. Cameron—Dried bouquets, etc.
Miss Nellie Littlehale—Two paintings and one drawing.
Madame Delisdiner, San Francisco—Tooth powder, face powder, Blume-de-Comelies, wonderful discovery for the hair, and Hair Victor.
John Reardon, Stockton—Patent window screen.
H. Adams, Stockton—Display of gas stoves.
D. A. Learned, Stockton—Collection of grapes; best five varieties of grapes, best single variety of grapes, best eight bunches of raisin grapes.
T. M. Antisell, display of grand, or semi-grand piano fortes; best semi-grand piano, one grand piano, one grand upright piano, two parlor upright pianos, one walnut upright piano, one church organ, two parlor organs.
J. P. Shafer, Stockton—One case coins.
Mrs. Joseph Hale, Stockton—One fruit cake, one pound cake, one sponge cake, one loaf brown bread, loaf wheat bread, one plate biscuit.
Miss Grace Hale. Stockton—One loaf wheat bread.
Mrs. E. H. Moss—One loaf wheat bread, one plate of biscuits, one loaf brown bread.
Mrs. G. A. Lyon—One loaf wheat bread, one loaf corn bread, one coffee cake.
Miss M. Lyon—Two sponge cakes, two plates biscuits.
Miss Eva Cook—One loaf wheat bread.
Mrs. O. F. Cook—One loaf wheat bread.
Mrs. C. J. Smith—One coffee cake, one loaf wheat bread, one plate biscuits.
Miss Julia R. Smith—Two loaves of brown bread.
Mrs. J. C. Reid—One pound cake, one fruit cake, one coffee cake, one loaf wheat bread, one plate biscuits.
Miss Lulu Reid—One loaf wheat bread.
Miss Mary Allen—One sponge cake.
Mrs. J. C. Reid—One plate biscuit.
Miss Nettie Campbell—One loaf wheat bread.

PREMIUMS AWARDED.

FIRST DEPARTMENT.—LIVE STOCK—HORSES.

CLASS I.—THOROUGHBREDS.

Best stallion, three years old and upwards, to eleven-year old br. h. Partisan, owned by D. W. Bury, Stockton, $30.

Best stallion, two years old, to two-year old br. h. Sun Dog, owned by N. W. Randall, Stockton, $15.

Best stallion, one year old, to one-year old b. h. Sam Boring, owned by Charles Murphy, San José, $10.

Best sucking colt, to Laura, five months, sorrel, owned by Judge D. S. Terry, Stockton, $5.

Best mare, three years old and upwards, to Mary Watson, eight-year old, bay, owned by Charles Murphy, San José, $20.

Best mare, two years old, to two-year old sorrel, Lillie Ashe, owned by Judge D. S. Terry, Stockton, $10.

Best mare, one year old, to one-year old sorrel, Lilo, owned by Samuel Miller, Stockton, $5.

Best sucking filly, to seven-months old, Brown Kitty, owned by Charles Murphy, San José, $5.

Best thoroughbred dam, with not less than four of her colts, all thoroughbreds, to Minnie Smith and family of colts, owned by Samuel Miller, Stanislaus County, $10.

Best stallion, other than thoroughbred, with not less than ten of his colts (open to all), to Chieftain, Jr., and family, owned by J. A. McCloud, Stockton, $15.

Best dam, other than thoroughbred, with not less than three of her colts, to Fanny Fern and family of five colts, owned by William Johnson, Grayson, Stanislaus County, $5.

CLASS III.—HORSES FOR ALL PURPOSES.

Best stallion, three years old and upwards, to dark chestnut, Franklin, five years old, owned by C. Halverson, Routier Postoffice, Sacramento County, second premium recommended.

Best stallion, three years old and upwards, to seven-year old d. c. Reuben Glenroy, owned by T. B. Graves, Farmington, $30.

Best stallion, two years old, to two-year old bay, Geo. S. Evans, owned by Wm. H. Douglass, Stockton, $15.

Second premium recommended to B. E. Harris, San Francisco, for ch. h. Dividend.

Best stallion, one year old, to one-year old chestnut sorrel, Grenadier, owned by Captain Ben. E. Harris, San Francisco, $10.

Second premium recommended to William Johnson Grayson, for blk c. Fred. Arnold.

Best sucking colt, to five-month old bay, no name, owned by B. F. Samuels, Lathrop, $5.

Second premium recommended to Geo. Schwartz, for b. c. General Dana, Jr.

Best mare, three years old and upwards, to three-year old bay, Nelly Endich, owned by N. Harrison, Farmington, $15.

Second premium recommended to B. E. Harris, San Francisco, for b. m. Lady Silva.

Best mare, two years old, to Molly Gibson, bay, two-year old, owned by N. Harrison, Farmington, $10.

Best mare, one year old, to Emma Boone, golden sorrel, one-year old, owned by Captain Ben. E. Harris, San Francisco, $5.

Second premium recommended to Jno. Visher, Modesto, for s. f. Baby Mine.

Best sucking filly, to Agnes, three months old, chestnut, owned by Captain Ben. E. Harris, San Francisco, $5.

Second premium recommended to B. F. Samuels, for b. f. Lilly.

CLASS IV—ROADSTERS.

Best stallion, four years old and over, to ten-year old s. h. Nutwood, owned by J. W. Knox, San Jose, $30.

Second premium recommended to W. E. Morris, Stockton, for ch. h. Priam.

Best stallion, three years old, to three-year old b. h. Jackson Temple, owned by Daniel Brown, Petaluma, Sonoma County, $20.

Second premium recommended to T. Cunningham, Stockton, for s. h., Jimmy.

Best stallion, two years old, to two-year old b. h. Hawthorne, owned by L. U. Shippee, Stockton, $10.

Best mare or gelding, four years old, to ten-year old bay mare Queen, owned by Alex. Chalmers, Stockton, $20.

Best mare or gelding, three years old, to three-year old b. m. Carrie F., owned by D. McCarty, Oakland, $10.

Second premium recommended to W. Johnson Grayson, for b. m. Mollie J.

Best mare or gelding, two years old, to two-year old c. s. Clara D., owned by J. H. Dodge, Stockton, $5.

Best span of roadsters, matched, two or more to compete, owned and used by one person, to two and three years old, Black Billy and Fanny, owned by Alex. Chalmers, Stockton, $25.

Second best span matched roadsters, to five and six-year-old bays, owned by Charles Dallas, Stockton, $10.

CLASS V.

Second premium recommended to Princess McDowell, one year old, owned by C. K. Bailey.

Second premium recommended to Dora, sucking filly, owned by O. B. Harvey, Rough and Ready.

The committee passed complimentary thanks to Mr. L. U. Shippee for exhibition of horses not entered for a premium, named as follows: Three years old, stallion, Prince Consort, color, bay; stallion, any breed or age, Henry Clay, color, bay; mare, any breed or age, Lady Patchen, color, bay; bay gelding, Lightfoot; bay yearling, by Nutwood; bay mare, Sacramento; bay mare, Stockton.

DRAFT HORSES.

Best stallion, three years old and upwards, to General Grant; bay horse, owned by Charles McLaughlin, Bantas, $30.

Second premium recommended to George W. Voorhies, Stockton, for bay horse Monarch.

Best stallion, one year old, to bay horse Monarch, Jr., owned by George W. Voorhies, Collegeville, $10.

Best sucking colt, to black colt Starr King, owned by C. K. Bailey, Linden, $5.

Best mare, three years old and upward, to bay mare Lady Clyde, owned by C. K. Bailey, Linden, $15.

Second premium recommended to O. B. Harvey, Rough and Ready, for brown mare Coaly.

Best mare, two years old, to gray mare Calote Queen, owned by C. K. Bailey, $10.

CLASS VI.—CARRIAGE HORSES.

Best span of carriage horses, to black Reuben and Prince, owned by J. K. Meyer, Stockton, $20.

Second best span of carriage horses, to bay Lucy and mate, owned by Osmond Johnson, Modesto, $10.

Best single buggy horse, owned and used by one person, to bay Alice Garratt, owned by D. McCarty, Oakland, $10.

Second premium recommended to H. F. Rosekrans, Modesto, for g. m. Winthrop Maid.

SWEEPSTAKE.

Best stallion of any breed or age, to sorrel Nutwood, owned by J. H. Knox, San José, $30.

Best mare of any breed or age, to b. m. Mary Watson, owned by Charles Murphy; San José, $20.

CLASS VII.—JACKS.

Best jack, two years or upward, to black John Henry, owned W. A. Munion, Dixon, Solano County, $20.

Best jennet, two years old or upward, to black Lexington, owned W. F. Foreman, Stockton, $10.

CLASS IX.—DURHAM CATTLE.

Best bull, three years old or over, to Red Thorndale, owned by Col. C. Younger, San José, $25.

Best bull, two years, to Gwyne Prince, owned by Charles Clark, Milpitas, Santa Clara County, $20.

Best bull, one year old, to 2d Red Thorndale, owned by Col. C. Younger, $10.

Best calf, under one year, to 16th Red Thorndale, owned by Col. C. Younger, $5.

Best cow, three years old or over, to 2d Rose of Forest Home, owned by Col. C. Younger, $20.

Best cow, two years old, to Fairy Queen 2d, owned by Jesse D. Carr, Gabilan, $15.

Best cow, one year old, no award.

Best heifer calf, under one year, to Red Dolly 6th, owned by Col. C. Younger, San José, $5.

Best heifer calf, under one year, to 19th Maid of Monterey, owned by J. D. Carr, Gabilan Ranch, $5.

[Being two awards, last two premiums will be divided.]

CLASS XI.—JERSEY AND ALDERNEY.

Best bull, three years old or over, to Hugo of Yerba Buena, owned by Henry Pierce, San Francisco, $25.

Best bull, two years old, to Toronto, owned by S. B. Kingsley, Stockton, $20.
Best bull, one year old, to Oliver, owned by S. B. Kingsley, $10.
Best calf, under one year, to Hero 2d, owned by S. B. Kingsley, $5.
Best cow, three years old or over, to Pearl 2d of Yerba Buena, owned by Henry Pierce, San Francisco, $20.
Best cow, two years old, to Mignonette of Yerba Buena, owned by Henry Pierce, San Francisco, $15.
Best cow, one year old, to Annie Carey of Yerba Buena, owned by Henry Pierce, San Francisco, $10.
Best heifer calf, under one year, to Jennie, owned by S. B. Kingsley, $5.

CLASS XII.—AYRSHIRE.

Best bull, three years old or over, to Melanchton Callaghan, owned by Geo. Bement, Redwood City, $25.
Best bull, one year old, to Archie, owned by Geo. Bement, $10.
Best cow, three years old or over, to Stellita, owned by Geo. Bement, $20.
Best cow, two years old, to Stellina, 4519, owned by Geo. Bement, $15.
Best cow, one year old, to Highland Maid, owned by Geo. Bement, F. D.

SWEEPSTAKES.

Best bull, of any breed or age, to 7th Red Thorndale, one year old, owned by Col. C. Younger, $25.
Best cow, of any breed or age, to Red Dolly 2d, three years old, owned by Col. C. Younger, $20.

CLASS XIV.—HERDS OF CATTLE.

Best herd of cattle, one breed, six, bull Red Thorndale, cow Dolly Thorndale, cow Red Dolly 2d, cow 2d Rose of Forest Home, cow 2d Belle of Avenue Ranch, cow 1st Golden Gate, owned by Col. C. Younger, San José, $30.
Best young herd of cattle, one breed, five, bull 7th Red Thorndale, cow 6th Rose of Forest Home, cow 6th Rosa Nell, cow 7th Rose of Forest Home, cow Jessie Maynard 2d, owned by Col. C. Younger, San José, $30.

Special premiums recommended to Guernsey cow Monica of Yerba Buena, owned by Henry Pierce, San Francisco, and to steer Dick, owned by K. W. Jones, Huron, Tulare County, California.

CLASS XVI.—SHEEP.

Best pen of five Cotswold ewes, one year old and over, to Col. C. Younger, San José, $7 50.
Best Cotswold ram, to Farwest, owned by Col. C. Younger, $10.

CLASS XVII.—SWINE.

Best Berkshire boar, Black Prince of Linden, owned by M. D. Boruck, Staten Island, $10.
Best Berkshire sow, Hattie of Linden, owned by M. D. Boruck, Staten Island, $10.

THIRD DEPARTMENT.

CLASS I.—AGRICULTURAL IMPLEMENTS.

Best seed drill, to W. A. Dorr, Stockton, $3.
Best churn, to W. A. Dorr, Stockton, $3.
Best large cultivator, to Matteson & Williamson, $5.
Best derrick fork, to W. A. Dorr, $5.
Best mowing machine, Buckeye, to W. A. Dorr, $5.
Best steel plow, to Matteson & Williamson, $3.
Best gang plow, to S. B. Bowen, $3.
Best cast plow, to Grangers' Union, $3.
Best grain sower, Gorham, to Grangers' Union, $5.
Best harrow, No. 6, to Matteson & Williamson, $3.
Best horse rake, Taylor, to W. A. Dorr, $3.
Best straw cutter, to W. A. Dorr, $3.

SWEEPSTAKES.

Best display of agricultural implements, to W. A. Dorr, $10.
Best windmill, to Abbott & Williams, Stockton, $10.
Special premiums recommended for Sherrill gang plow and seed sower.

COMMITTEE REPORT.

We have examined and seen the practical working of Clark's Grain Grader and Seed Cleaner, a new fanning mill attachment. It is used in one of Nash & Cutt's improved cleaners. After chaffing, the gang is removed and the new device is substituted, and does, in our opinion, superior work in grading and making a first quality of seed grain, and we most cheerfully recommend it to the public.

Special premium recommended to Wm. G. Phelps for a road grader, scraper, and open ditch plow.

CLASS II.—WHEELWRIGHT WORK.

Best two-horse wagon, to Grangers' Union, Stockton, $5.
Special premium recommended for a one-horse buckboard, manufactured by J. H. Hansel, Stockton.
Special premium recommended to Grangers' Union, Stockton, for a large display of farm, road, and freight wagons.
Special mention to W. A. Dorr, Stockton, for display of Rumsey pumps.

SPECIAL GLASS BALL SHOOTING.

For Association Gold Medal and purses; entrance fees, $57 50. Winner of gold medal to hold same, subject to challenge by resident of the district, for one year; stake, $15.

PRIZES AWARDED.

Score 49, to F. N. Lastreto, gold medal and $8 63.
Score 47, to Charles Smith, $14 38.
Score 46, to Oscar Marshal, $11 50.
Score 41, to Henry Ortman, $7 19.
Score 40, to Frank White, $5 75.
Score 39, to A. E. Meyer, $3 35.
Score 39, to W. Burnett, $3 35.
Score 39, to W. E. Saunders, $3 35.

SECOND DEPARTMENT.

CLASS I.—FARM PRODUCTS.

Best five pounds soft and hard shell almonds, to J. M. Ladd, Stockton, $2.
Best fifty pounds corn in ear, to A. J. Woods, Acampo, $3.
Best fifty pounds castor beans, to T. J. Murray, Stockton, $3.

CLASS II.—VEGETABLES.

Best and largest variety of vegetables raised on one ranch and exhibited by producer, to T. J. Murray, Stockton, $10.
Second best and largest variety of vegetables raised on one ranch and exhibited by producer, to Joseph Hale, Stockton, $5.

SWEEPSTAKES.

Best and largest exhibit of vegetables, fruit, etc., by one person, to C. V. Thompson, Stockton, $15.

CLASS III.—WINES AND BRANDIES.

Best grape brandy, vintage 1878, to George West & Company, Stockton, $5.
Best white wine (dry), vintage 1878, to George West & Company, Stockton, $5.
Best red wine (dry), vintage 1878, to George West & Company, Stockton, $5.
Best white wine (sweet), vintage 1877, to George West & Company, Stockton, $5.
Best port wine (sweet), vintage 1876, to George West & Company, Stockton, $5.
Best Angelica wine (sweet), vintage 1877, to George West & Company, Stockton, $5.
Best sherry wine (special), vintage 1872, to George West & Company, Stockton, $5.
Best Madeira wine (special), vintage 1872, to George West & Company, Stockton, $5.
Best sparkling wine, vintage 1878, to George West & Company, Stockton, $5.
Greatest and best assortment of wines, to George West & Company, Stockton, $10.

CLASS IV.—HORTICULTURAL.

Best collection of pears, to Herbert Lyons, Stockton, $5.

GRAPES.

Best collection, to D. A. Learned, Stockton, $10.
Second best collection, to George West, Stockton, $5.
Best five varieties, to Jacob Meyer, French Camp, $5.
Second best five varieties, to Mrs. S. W. Sperry, Stockton, American Agriculturist for 1881.
Best single variety, to Geo. West, Stockton, $5.
Best eight bunches raisin grapes, to D. A. Learned, Stockton, $5.

FIGS.

Best collection, to Robert Reed, Stockton, $3.
Second best collection, to T. J. Murray, Stockton, American Agriculturist for 1881.
Best six specimens, to Robert Reed, Stockton, $3.

ORANGES.

Best exhibit, to Dr. R. K. Reid, Stockton, $5.

DRIED FRUIT.

Best box of figs, to E. J. Smith, Stockton, $3.
Second best box of figs, to Mrs. C. J. Smith, Stockton, $2.
Best box of plums, to Herbert Lyons, Stockton, $3.
Best box of peaches, to E. J. Smith, Stockton, $2.
Best box of pears, to E. J. Smith, Stockton, $2.
Best box of dried apricots, to Miss Lulu Reed, Stockton, $2.

Special notice is called to the vegetables dried in the California Fruit Dryer, exhibited by E. J. Smith, Stockton.

FRUITS IN GLASS.

Best exhibit preserved in spirits, to Mrs. Joseph Hale, Stockton, $5.
Second best exhibit, to Mrs. J. C. Reid, Stockton, $2 50.

FRUITS PRESERVED IN SUGAR.

Best exhibit, to Mrs. Joseph Hale, Stockton, $10.
Second best exhibit, to Mrs. J. C. Reid, Stockton, $5.

JELLIES.

Best exhibit, to Mrs. J. C. Reid, Stockton, $5.
Second best exhibit, to Mrs. Joseph Hale, Stockton, $2 50.

PICKLES.

Best exhibit, to Mrs. Joseph Hale, Stockton, $5.
Second best exhibit, to Mrs. J. C. Reid, Stockton, $2 50.

CLASS V.—HOME WORK.

Best twenty-five pounds of butter, packed before July 1, 1880, to William Christopher, Stockton, $5.
Best cheese, thirty pounds or more, to Samuel Miller, Stanislaus County, $5.

CLASS VI.—FLORAL.

Best display of cut flowers, to Duncan Cameron, Stockton, $2.
Best display of hanging baskets containing plants, to Duncan Cameron, Stockton, $2.
Best display of bouquets, to Duncan Cameron, Stockton, $2.
Best collection of fuchsias in bloom, to Mrs. R. S. Bates, Stockton, $2.
Best collection of plants suitable for green house, to Mrs. R. S. Bates, Stockton, $2.
Largest collection of flowering plants in bloom, to Mrs. R. S. Bates, Stockton, $10.
Best collection of rare plants, to Mrs. R. S. Bates, Stockton, one year's subscription to the American Agriculturist, 1881.

CULINARY.

Best brown bread, to Mrs. Julia R. Smith, Stockton, $2 50.
Best coffee cake, to Mrs. C. J. Smith, Stockton, $2 50.
Best fruit cake, home made, to Mrs. Jos. Hale, Stockton, $3.
Best pound cake, home made, to Mrs. Jos. Hale, Stockton, $3.

Best sponge cake, home made, to Mrs. Jos. Hale, Stockton, $2 50.
Best corn bread, home made, to Mrs. E. A. Moss, Stockton, $2 50.
Best plate biscuit, home made, to Miss M. Lyon, Stockton, $2 50.
Best wheat bread, home made, to Mrs. O. F. Cook, Stockton, $3.

SPECIAL PREMIUMS.

By J. Pitcher Spooner, photographist, a $10 photograph to the Miss under sixteen years, residing in the district, who exhibits the best loaf of bread made by herself.
Best loaf of bread, to Miss Nellie Campbell, Stockton, $10 photograph.
Special mention for jelly cake, made by Miss Lyde H. Hickman, aged ten years.

CLASS VII.—MANUFACTURES.

Best display of paper, consisting of twelve bundles printing paper, one six hundred-pound roll printing paper, fifteen reams butter paper, two hundred reams wrapping paper, to California Paper Company, $10.

THIRD DEPARTMENT.

CLASS III.—HARNESS AND LEATHER.

Best set of carriage harness, to H. T. Dorrance, Stockton, $5.
Best single harness, to H. T. Dorrance, Stockton, $5.
Best saddle, to H. T. Dorrance, Stockton, $5.
Best bridle and saddle, to H. T. Dorrance, Stockton, $5.
Best display of harness and saddlery, to H. T. Dorrance, Stockton, $10.

The committee find no premiums offered for horse collars, but find the exhibition made by J. H. Andrews, of Stockton, of superior workmanship, and well adapted for the uses for which the articles are intended.

CLASS VI.

Best set bedroom furniture, to Sylvester & Moye, Stockton, $5.
Best set parlor furniture, to Sylvester & Moye, Stockton, $5.
Best writing desk, to Sylvester & Moye, Stockton, $3.
Best dressing bureau, to Sylvester & Moye, Stockton, $5.
Best sofa, to Sylvester & Moye, Stockton, $5.
Best lounge, to Sylvester & Moye, Stockton, $3.
Best extension table, to Sylvester & Moye, Stockton, $3.
Best center table, to Sylvester & Moye, Stockton, $3.
Best patent spring bed, to T. S. Clark & Co., San Francisco, $5.
Best school furniture, to Geo. H. Fuller, San Francisco, $5.
Best sick chair, or couch, to T. S. Clark & Co., San Francisco, $3.

CLASS VII.—MISCELLANEOUS.

Special premium recommended to Henry Adams, Stockton, for large display of gas stoves.
Best display of furniture, to Sylvester & Moye, Stockton, $10.
Best display of upholstery, to Sylvester & Moye, Stockton, $5.
Best display of carpets and oil cloths, to Sylvester & Moye, Stockton, $5.
Best display of hats and caps, to Lothrop & Noble, $5.
Best display boots and shoes, to Steinhart Bros., Stockton, framed diploma.
Best display of stoves, to Ruhl & Floyd, Stockton, $5.
John Hoerr exhibits a very fine display of ladies' shoes. (Not entered for premium.)

MUSICAL INSTRUMENTS.

Best grand or semi-grand piano, to Sylvester & Moye, Stockton, $10.
Best parlor organ, to Sylvester & Moye, Stockton, $5.
Diploma recommended to T. M. Antisell, for largest display of musical instruments.
Diploma recommended to E. A. Baird, for Packard orchestral organ.

SWEEPSTAKES.

Best display of pianos, organs, etc., to Sylvester & Moye, Stockton, $10.

SEWING MACHINES.

Best family sewing machine, to Davis sewing machine, framed diploma.
Best and greatest variety of work by any sewing machine, to Davis sewing machine, framed diploma.

SWEEPSTAKES.

Best sewing machine for all purposes, to Davis sewing machine, diploma.
Best sewing machine for fancy work, to Davis sewing machine.

CLASS VIII.

Best single piece worsted embroidery, to Mrs. S. W. Sperry, Stockton, $2.
Best single piece silk embroidery on silk, to Mrs. J. E. Boyce, Stockton, $2.
Best single piece silk embroidery on cotton or woolen, to Miss Mary Allen, $2.
Best single piece cotton embroidery, to Mrs. J. E. Boyce, $2.
Best single piece embroidery on lace, to Mrs. F. Stewart, Stockton, $2.
Best single piece crochet work, to Katy Kinney, Stockton, $2.
Best single piece patchwork, to Mrs. J. E. Boyce, Stockton, $2.
Best single piece of quilting, to Mrs. D. Odell, Stockton, $2.
Best single piece hemstitching, to Mrs. J. W. Hart, Stockton, $1 50.
Best single piece chenille work, to Mrs. A. A. Fogg, Stockton, $2.
Best single crochet lamp mat, to Mrs. Bouche, Stockton, $2.
Best single lamp mat, of any kind, to Miss May Sumerville, Stockton, $2.
Best single sofa pillow, of any kind, to Miss May Sumerville, Stockton, $2 50.
Best single rag mat, to Mrs. I. R. Wilbur, Stockton, $2.
Best single door rug, to Mrs. F. Stewart, Stockton, $2.
Best tatting, to Eugenie R. J. Excoffier, Stockton, $1 50.
Best rag carpet, to Mrs. M. Scalerandi, $3.
Best baby dress, to Mrs. J. E. Boyce, Stockton, $2.
Best baby carriage afghan, to Gus. Gumpertz, Stockton, $2 50.
Best ottoman cover, to Mrs. F. Stewart, Stockton, $2.
Best gent's shirt (work of exhibitor), to Mrs. J. C. Reid, Stockton, $2.

We call special attention to the fine display of many varieties of worsted work by Mrs. Bouche. Her sofa pillow and pincushion are worthy of special notice. Also, special notice to Mrs. James Tatterson's floor mat.

CLASS IX.

Best specimen sea moss, to Mrs. Joseph Hale, Stockton, $1 50.
Best specimen flower work, to Mrs. Joseph Hale, Stockton, $1 50.
Best wax flowers, to Mrs. A. A. Fogg, Stockton, $2.
Best specimen worsted flowers, to Miss Nettie Petzinger, Stockton, $2.
Best single piece bead work, to Mrs. J. E. Boyce, Stockton, $1.
Best arranged Autumn leaves, to Mrs. A. A. Fogg, Stockton, $1 50.
Best specimen braid work, to Eugenie R. J. Excoffier, San Francisco, $2.

CLASS X.

Best display of needlework, to Mrs. M. Cottle, Stockton, $5.
Best display of crochet work, to Mrs. C. J. Smith, Stockton, $4.
Best display of embroidery, to Miss May Summerville, Stockton, $3.
Best display of millinery, to Mrs. Thomas Eckstrome, Stockton, $4.
Best display of family machine sewing (work of exhibitor), to Mrs. J. C. Reid, Stockton, $4.
Best display of feather flowers, to Mrs. J. W. Hart, $2.

SWEEPSTAKES.

Best and purest yeast powder, to H. G. Boisselier, Stockton, framed diploma.

FOURTH DEPARTMENT.

ENCOURAGEMENT OF YOUNG PEOPLE.

For boys and misses under sixteen years of age—Best patchwork, to Miss Lulu Nichols, one dozen Spooner's photographs.
Best worsted embroidery, to Miss O. Bailey, $2.
Best darning, to Adda Goodell, Stockton, $2.
Best exhibit of needlework, to Nettie O. Bailey, $5.
Best crochet work, to Addie M. Bailey, $2.
Best plain sewing, to Miss Lulu Reid, $3.
Best map of California with subdivisions, to Geoffrey Smith, one dozen Spooner's photographs.
Best pencil drawing, to Miss Nellie Littlehale, one dozen Spooner's photographs.
Best lettering, to Geoffrey Smith, $2.
Special premium recommended for paintings in water color, executed by Miss Nellie Littlehale.
Premiums open for competition only to the pupils of the public schools in the district.
Best map drawing, Geoffrey Smith, Stockton, $3.

FIFTH DEPARTMENT.

CLASS I.

Best exhibition of portrait painting in oil, to Mrs. G. S. Allard, Stockton, $5.
Best exhibition of black crayon drawings, to J. P. Spooner, Stockton, $3.
Best exhibition of photographs, to J. P. Spooner, Stockton, $10.
Best exhibition of landscape painting in oil, to C. P. Troy, Petaluma, $5.
Best exhibition of ivorytype, to Miss Maggie Andrews, Stockton, $3.
Best specimens of water color drawing, to F. J. Corcoran, Stockton, $3.
Best exhibition of pen drawing, to E. B. Stowe, Stockton, $3.
Best exhibition of penmanship, to E. B. Stowe, Stockton, $3.
Best exhibition of steel engravings, to Mrs. O. F. Cook, Stockton, $3.
Specimen of portrait painting, to Miss Laura Trahern, Stockton, $3.

The committee recommend a special premium to Miss Bessie Stewart, of Stockton, for a fine display of oil paintings; also desire to make special mention of the following:
Crayon drawing by F. J. Corcoran, Stockton.
Water color on silk, by Miss Maggie Andrews, Stockton.
Water colors of flowers, painting on silk, and painting on wood, by Miss West, Stockton.
Oil painting, by Miss Hattie A. Keep, Stockton.

MISCELLANEOUS.

The Committee on Miscellaneous Exhibits recommend as follows:
Diploma to Dr. A. G. Scott, San Francisco, for Russian polish.
Special premium to Jas. H. Gates, San Francisco, for pepsin wine bitters.
Honorable mention to F. C. Feens, San Francisco, for beef shaver, vegetable slicer, and twine cutter.
Worthy mention to Meyer & Duncan, San Francisco, for corn planter, and for apple corer and divider.
Honorable mention to Miss May Sumerville, Stockton, for a display of tidies.
Diploma to Henry Weiner, San Francisco, for display of fifty green canary birds from Hartz Mountains.
Special mention to Mrs. Bouche, Stockton, for toilet sets.
Diploma to Geo. West & Co., for blackberry and cherry brandy.
Diploma and honorable mention to G. N. Milco, of the Buhach Manufacturing and Producing Company, for a display of buhach and insufflators.
Special mention of a bearing cranberry plant, from I. N. Hoag, Sacramento.
Special mention of mammoth lash, exhibited by J. H. Andrews, Stockton.
Special premium recommended to John R. Williams, Stockton, for display of patent medicines; also for exhibition of Dr. J. Elliot's family and horse liniment.
Premium recommended to Dr. E. S. Holden, San Francisco, for display of Holden's etherial cough syrup.
Diploma to Hermann Bros., Stockton, for display of Chicago bottled beer and Budweiser beer.
Premium recommended to Steinhart Bros., display of clothing and furnishing goods.
Special premium recommended to Gus. Gumpertz, Stockton, for display and exhibit of mode of manufacture of underwear.
Diploma to J. C. Gage, Stockton, for model of self-regulating windmill.
Diploma to Miss S. C. Dorrance, for display of coin specimens and display of keramic art.
Special premium recommended to T. S. Clark, San Francisco, for the following display: Gas-pipe bedstead with woven wire mattress attached; woven wire mattress; hotel cob patent springs; and diploma recommended for a walnut folding parlor bed.
Diploma to F. Wedekind for Albany lager beer, for Albany bock beer, for Albany bottled beer.
Diploma to George H. Fuller for folding settee and for store stools—California inventions.
Honorable mention to Dr. R. K. Reid for exhibition of pomegranates, grown in Stockton.
Diploma to John Clifford for specimen of model work—car truck.
Honorable mention to D. Cameron for a fine display of ornamental grasses and dried bouquets.
Diploma to John Reardon for patent window screens.
A premium especially recommended to E. J. Smith, for the New California Fruit Dryer.
Special mention of tooth powder and hairdressing exhibited by Madame Delisdinere, San Francisco.
Special mention of case of ancient and rare coins exhibited by J. P. Shaver, Stockton.
Diploma to L. O. Hudson, Stockton, for combined pantry dresser and sideboard.
Diploma to H. H. Moore & Son, for fine display of toilet goods and manufactured drugs.
Special mention of a very fine display of dried grasses and bouquets of California native grasses, shown by L. Begg, San Francisco.
Honorable mention to Wm. M. Hickman, Stockton, for exhibition of squirrel poison and display of perfumery and hairdressing.
Honorable mention of a display of fruits, nuts, and corn, collected in various Eastern States, by Wm. Graham, Stockton.
Special mention to Ed. Adolph, for system of dress fitting.

SPEED PROGRAMME--1880.

TUESDAY, SEPTEMBER 28.

Class I.—Four-year Old District Trotting.

Purse—Two hundred dollars. Best three in five. (Six entries.)

G. W. Trahern's b. m. Belle McClellan, by General McClellan	2	1	1	2	1
Wm. Johnson's s. m. May W., by Winthrop	1	2	2	1	2
Randle & Carlton's ch. m. Lena Carlton, by Immigration	3	dis.			
F. S. Hatch's b. g. Blaine, by Billy Hayward	4	dis.			

Time—3:00; 2:52¾; 2:54; 2:56; 2:57½.

Class II.—2:36 Coast Trotting.

Purse—Seven hundred dollars. Best three in five. (Eight entries.)

James Price's ch. m. Mollie Drew, by Winthrop	3	2	2	1	1	1
D. J. Green's b. m. Lady Ellen, by Carr's Mambrino	2	1	1	2	2	2
L. Stanford's blk. g. Clay, by Fred. Lowe	1	3	3	4	4	3
G. Valensin's ch. m. Venus, by Venture	4	4	4	3	3r.o.	

Time—2:32½; 2:31; 2:30; 2:31¾; 2:30; 2:27.

WEDNESDAY, SEPTEMBER 29.

Class III.—District Running.

Purse—Four hundred dollars. Mile and repeat heats; free for all. (Six entries.)

Jack Douglass' ch. c. Jack Douglass, by Wildidle	3	1	1
J. H. Tone's s. m. Maggie Early, by Joe Daniels	1	2	3
D. S. Terry's s. m. Bessie Sedgwick, by Joe Daniels	2	3	2
John Miller's b. c. Lame Deer, by Joe Daniels	dis.		

Time—1:47; 1:46½; 1:48.

Class IV.—Slow District Trotting.

Purse—Two hundred and fifty dollars. Best three in five. (Eight entries.)

A. C. Davenport's b. h. Little Don, by Green's Bashaw	2	2	1	2	1	1
T. J. Young's b. g. Tom Palmer, by Tecumseh	4	4	2	1	2	2
C. David's blk. h. Ben. Allen, by Sportsman	1	3	3	3	3	4
H. F. Rosekrans' s. h. Young Hiram, by Hiram Woodruff	3	1	4	4	4	3
J. A. McCloud's ch. g. Lieutenant, by McClellan	dis.					
G. W. Trahern's b. m. Belle McClellan, by McClellan	dis.					
Thos. W. Wallace's b. m. Modesto Maid, by Patchen	dis.					

Time—2:36; 2:39; 2:40; 2:42; 2:42; 2:42½.

Class V.—Pacing.

Purse—Three hundred dollars. Best three in five; free for all. (Six entries.)

Geo. A. Vignolo's dun g. Johnny Weigle, pedigree unknown	1	2	1	1
W. H. Cade's s. g. Nimrod, pedigree unknown	2	1	2	2
L. Dickey's s. g. Colonel Dickey, by Kentucky Hunter	3	3	3	3
Sorensen & Petersen's b. g. Brewery Boy, pedigree unknown	4	4	4	4
E. H. Robison's b. g. Hiram Tracy, by Tecumseh	5	5	dis.	

Time—2:31½; 2:28; 2:24; 2:26.

THURSDAY, SEPTEMBER 30, 1880.

CLASS VI.—THREE-YEAR OLD COLT TROTTING.

Purse—Five hundred dollars. Best three in five. Free for all. (Eight entries.)

Steve Crandall's b. c. Alex. Button, by Alexander	1	1	1
J. H. Dodge's s. h. Honesty, by Priam	2	2	3
C. A. Durfee's g. h. Len Rose, by O. W. Richmond	4	3	2
W. E. Morris' s. h. Upright, by Whipple's Hambletonian	3	4	4

Time—2:32; 2:33½; 2:32½.

CLASS VII.—TWO-TWENTY-NINE COAST TROTTING.

Purse—Seven hundred dollars. Best three in five. (Six entries.)

A. B. and S. K. Whipple's ch. h. Crown Point, by Speculation	1	1	2	2	0	1
D. Brown's br. h. Volunteer, by General Dana	2	2	1	1	0	2
D. McCarty's b. m. Cassie Mack, by McClellan	3	dis.				

Time—2:29; 2:26¾; 2:27; 2:28; 2:30; 2:35.

SPECIAL.—THREE-YEAR OLD DISTRICT RUNNING.

Purse—One hundred and fifty dollars. Mile and repeat. (Six entries.)

J. Walden's s. f. Belle Girard, by Joe Daniels	1	0	1
J. A. Shepherd's b. f. Lena R., by Joe Daniels	2	0	2
John Miller's b. f. Picnic, by Joe Daniels	3	dis.	
D. S. Terry's b. g. Jack Gowdy, three years old, by Leinster	dis.		

Time—1:49¾; 1:50½; 1:52½.

FRIDAY, OCTOBER 1, 1880.

CLASS VIII.—RUNNING.

Mile and repeat. Stakes—Fifty dollars each, half forfeit; two hundred and fifty dollars added. Free for all. (Seven forfeits paid.)

J. H. Tone's s. m. Maggie Early, by Joe Daniels	3	1	1
F. S. Malone's b. m. Lilly R., by Longfellow	1	3	3
D. S. Terry's s. m. Bessie Sedgwick, by Joe Daniels	4	2	2
George Sutherland's b. g. George Bender, sire unknown	2	4	4

Time—1:47¼; 1:46½: 1:47.

CLASS IX.—TWO-THIRTY-THREE DISTRICT TROTTING.

Purse—Four hundred dollars. Best three in five. (Seven entries.)

L. U. Shippee's blk. g. Tom Stout, by The Moor	2	1	1	1
George Rupert's blk. g. Castoria, by Rising Star	3	2	2	2
J. A. McCloud's b. m. Daisy, by Chieftain	1	3	3	dis.
A. J. Packard's b. m. Nellie Packard, pedigree unknown	4	4	dis.	
H. F. Rosekrans' s. h. Young Hiram, by Hiram Woodruff	5	5	dis.	
L. M. Morse's s. m. Hattie, by Young Hunter	dis.			

Time—2:37; 2:35½; 2:33; 2:33.

SPECIAL TROTTING AGAINST TIME.

Purse—Two hundred dollars, for Nutwood to beat 2:18¾. One mile heat.

J. W. Knox's c. h. Nutwood, by Belmont	1

Time—2:19.

Special—District Trotting for Named Horses.

Purse—One hundred dollars. Best three in five. (Seven entries.)

C. David's blk. h. Ben. Allen, by Sportsman	2	1	0	1	0	2	1
John Patterson's ch. g. Frank Hunter, by Kentucky Hunter	1	2	0	2	0	1	2
H. D. C. Barnhart's b. m. Jennie Hunter, by Kentucky Hunter	3	dis.					
H. F. Rosekrans' r. h. Shuffler; pedigree unknown	dis.						

Time—2:44½; 2:40; 2:45; 2:42¾; 2:41; 2:41; 2:39.

SATURDAY, OCTOBER 2, 1880.

Class XI—Two-Twenty-Five Coast Trotting.

Purse—Seven hundred dollars. Best three in five. (Six entries.)

M. Salisbury's b. h. Gibraltar, by Echo	1	1	1
D. McCarty's b. m. Cassie Mack, by McClellan	2	3	2
J. A. Learned's b. h. Reliance, by Alexander	3	2	3

Time—2:41½: 2:32; 2:41½.

Class XII—Three-Year-Old District Trotting.

Purse—Two hundred and fifty dollars. Best two in three. (Six entries.)

J. H. Dodge's s. h. Honesty, by Priam	1	1
W. E. Morris' s. h. Upright, by Whipple's Hambletonian	2	2
E. Newland's r. f. Phaceola, by Silver Thread	dis.	

Time—2:38½; 2:41.

Special—Running.

Stakes—One hundred dollars each. One and a half miles dash.

J. H. Tone's s. m. Maggie Early, by Joe Daniels	1
D. S. Terry's s. m. Bessie Sedgwick, by Joe Daniels	2

Time—2:47½.

Special—Trotting.

Purse—One hundred dollars. Match race, best three in five.

H. D. C. Barnhart's blk. m. Jennie Hunter, by Kentucky Hunter	2	1	1
J. A. McCloud's ch. g. Lieutenant, by McClellan	1	2	2

Time—2:42; 2:42; 2:42½.

I hereby certify that the foregoing is a correct transcript of the official record of time made over the course of the San Joaquin Valley Agricultural Association during the year eighteen hundred and eighty, and that the same has been compared by me with the original, now on file in my office.

Attest: J. M. LaRUE, Secretary.

TRANSACTIONS

OF THE

Third District Agricultural Association

For 1880.

The District is composed of the Counties of Sutter, Yuba, Butte, Colusa, Tehama, Yolo, and Sacramento.

OFFICERS OF THE ASSOCIATION.

President.

A. B. COLLINS	Chico.

Secretary.

W. S. ELIOT	Chico.

Treasurer.

CHARLES FAULKNER	Chico.

BOARD OF DIRECTORS.

A. B. COLLINS	Butte County.
W. S. MANLOVE	Sacramento County.
C. C. MASON	Butte County.
L. H. McINTOSH	Colusa County.
O. L. CLARK	Butte County.
N. D. RIDEOUT	Yuba County.
H. C. WILSON	Tehama County.
ALLEN HENRY	Butte County.

REPORT.

Chico, November 25, 1880.

To the honorable the State Board of Agriculture:

Pursuant to the provisions of an Act of the Legislature of the State of California, entitled an Act to provide for the management and control of the State and District Agricultural Societies by the State, approved April 15, 1880, the Directors of District Agricultural Association Number Three respectfully submit this their first report of the transactions of said Association, for the year ending this date.

S. W. ELIOT, Secretary.

OPENING ADDRESS OF THE PRESIDENT,

Delivered at the Pavilion, October 5, 1880.

Ladies and Gentlemen, and Members of the Third District Agricultural Society: In pursuance of the laws enacted by the late Assembly of this State, I have been called upon to preside, as your President, over the Agricultural Association of this district. I esteem it a great honor to have been thus selected, and I assure you that I have done whatever I could to make this association, new and unusual in most of its features, a success, and to this end the various officers of the association have given me their aid and assistance, without which I could have done but little. The wisdom of the law under which we are now organized cannot be fully shown or determined by this single trial. Not all of the counties comprising this district are as fully represented as could have been desired, still I am glad that the present management can congratulate you that it will be a success. It gives us great pleasure, therefore, to know that that interest in agriculture and horticulture, for which our citizens are noted, has lost nothing since our last exhibition, but that there is a healthy and steady progress in agricultural affairs manifested throughout the Northern Sacramento Valley. Let us sincerely trust that this devotion to the greatest and noblest interests of man may still continue with unabated zeal and vigor.

Gentlemen, the Fair of the Third District Agricultural Association, composed of the Counties of Sutter, Yuba, Butte, Colusa, Tehama, Yolo, and Sacramento, is now opened for the transaction of business.

ANNUAL ADDRESS,

Delivered at the Pavilion, Thursday Evening, October 7, by Hon. I. N. Hoag.

Mr. President and Ladies and Gentlemen: When I received the unanimous invitation of your Board of Agriculture to deliver the annual address on this occasion, I frankly acknowledge that I felt somewhat flattered. To be called upon to address so large and intelligent a body of one's fellow-citizens on an occasion of so much importance as their annual harvest feast, when all the industrial classes come together, bringing with them the best products of a year's enterprise, skill, and industry, as free offerings upon the altar of their country's material prosperity, it is indeed an honor to be selected to give voice to their sincere thanksgivings and festive rejoicings.

But, sir, there are other reasons why I feel flattered and proud of this occasion. In selecting a practical farmer to deliver the annual address at your agricultural fair, your Board has stepped out of the beaten path in which agricultural associations have been traveling of late years—has taken a new departure from the ordinary course of such organizations. Why, sir, our State Agricultural Society has now been in existence since eighteen hundred and fifty-four; has held twenty-seven annual fairs, gathering together, each year, from all sections of the State, the stock breeders, the grain farmers, the dairymen, the fruit growers, the viniculturists, the practical men in all the various agricultural and mechanical occupations, that they might, by association, by comparison of notes and comparison of products, mutually improve each other; that they might, from these great occasions, receive renewed inspiration, renewed courage, and renewed energy and enterprise; but, above all, that they might receive practical instructions from those competent to instruct them in the arts and sciences and practices particularly relating to their several branches of industry; that they might have, on these occasions, the rare opportunity of listening to agricultural and technical lectures or addresses, delivered by men eminent for their researches and discoveries in the natural sciences, and distinguished for their practical application of lessons thus learned in all the branches of agriculture and mechanic arts; that they might drink in new and practical lessons from the lips of men who have solved the mysteries of scientific and successful breeding of domestic animals, and who have given to the world the best specimens of the horse, horned cattle, sheep, and swine; that they might be taught lessons in practical horticulture by men whose lives, like Downing and Marshall, have been devoted to originating and improving the apple, the peach, the pear, the plum, the cherry, the apricot, nectarine, and other fruits of the temperate zone, and in introducing the tropical fruits wherever a climate could be found adapted to their culture; that the great secret of making the soil produce frequent and abundant crops of wheat, the great bread-making grain of the civilized world, might, on these grand annual gatherings of the farmers, be made plain to all interested in this branch of agriculture by lecturers, who, in their laboratories, have analyzed the soils and their products and discovered what ingredients it is necessary to return to the soils in order to keep up their virgin fertility, and who have put their discoveries into practice by engaging in the real business of wheat culture, and demonstrating to their fellow-farmers the value of their precepts by the success of their experiments. I say that our State Agricultural Society has now for twenty-seven successive years held annual fairs, and has had twenty-seven annual addresses delivered before the assembled farmers, with the avowed object of bringing about by the means stated, improvement and advancement in agricultural knowledge and agricultural practices. But who have been the teachers selected? Who have delivered these twenty-seven annual agricultural addresses? Of all the men that have been called by the society to teach practical agriculture on these occasions, but three have been practical farmers. All the others have been lawyers, politicians, doctors, and ministers of the gospel. Though all eminent in their several professions, they have been conspicuous in their lack of a practical knowledge of that greatest of arts and that greatest of sciences, the art and science of agriculture. Of the three practical farmers who have been so distinguished by our State Agricultural Society, one is the pioneer farmer of northern California—the founder of your own beautiful city, and a strong friend of your present district agricultural society, the first annual exhibition of which we have met here on this occasion to commemorate.

Mr. President, when there are so many to select from, and so few are selected, the favored ones have reason to be proud. But, sir, I am inclined to think that the invitation of your Board was sent to me for other reasons, as well as because you recognized in me a practical farmer. You were aware that I was somewhat active in the preparation and passage of the law under which the State Agricultural Society is at present organized, as well as that by which the State is divided into agricultural districts and the several district associations are formed.

Hence, it may be appropriate on this occasion to briefly state the reasons that prompted the preparation and passage of these laws, and the results it is desired to bring about by their operation. The present State Constitution contains a clause prohibiting the appropriation of any money from the State treasury, by the Legislature, to any corporation or association not exclusively under the management and control of the State. When this Constitution was adopted, therefore, it left the State Society and all the county and district societies without recognition by the State Government. However much good they might be doing in the way of encouragement of immigration and the development of the material resources; however much they might be inducing capital and enterprise to come into the State and engage in agriculture, manufactures, and internal improvements; however much they might, by their annual fairs, by their correspondence, and by other means, be improving the breeds and value of the domestic animals of the State; whatever good they might be capable of doing in the way of introducing and improving labor-saving machinery, by which the expense of production would be lessened, and the profits of the same increased, and whatever good might grow out of their efforts to spread correct agricultural practices in the way of the cultivation and management of the soil and the harvesting and marketing of the crops; all these industrial associations were to be wholly ignored by the State Government, and left entirely to the support, management, and control of private means, energy, and enterprise. Under this system the farmers, the mechanics, the manufacturers, all the material industries, and all the laboring classes of the State that look to these industries for employment and the means of a livelihood, were to be ignored by the State as unworthy of its fostering care and support. All that gives vital energy to a country, and brings about material prosperity; all that renders educational and social advancement possible; all that forms the basis of civilization in times of peace, and strengthens the armies of a government in times of war, was, under the new Constitution and the laws as they stood at its adoption, to be ignored by the government, and left entirely to the voluntary efforts of individuals.

The lands of our farms, the improvements thereon, all our cattle, sheep, and swine, all our household goods, and household gods, even our orchards and vineyards, our vegetable gardens, and our flower gardens in the front dooryards, made and attended by our wives and daughters, were to be assessed and taxed. All the woolen mills, flouring mills, foundries, sawmills, paper mills, carriage factories, furniture factories, chemical works, quartz mills, bag factories, manufactories of agricultural implements and machinery, and all other mills, factories, and shops used and maintained by mechanics and manufacturers of every class or name—even the skill and inventive genius of our people—was to be assessed and taxed, and the money thus accumulated to be paid into the State treasury, there to remain forever beyond the control of those who had contributed it. Though our agents—our own chosen legislators—could appropriate this money without limit for political purposes and schemes, could use it indirectly to induce the importation of goods from other States and countries, and thus give aid to industries and enterprises and labor beyond the limits of the State, they were forever prohibited from returning directly or indirectly one cent of it to organizations within the State, whose only object was to encourage home industries, home improvements, home manufacturers, home labor, and home prosperity. Thus our Empire State of the Pacific, the nucleus and the center of a great industrial empire west of the Rocky Mountains, and containing within her borders more undeveloped agricultural, mineral, and manufacturing resources than any other equal area of the earth's surface, was to turn her back upon all the industrial lessons of the past. She was to close her eyes to the policy of encouraging the industries adopted by the great Napoleon, which placed France foremost among the Powers of the earth. She was to take no heed of the governmental aid extended by Germany to the industrial schools and experimental stations of that country, through which the German philosophers and chemists became the authoritative exponents of the laws of production to the rest of the world. She was to ignore the policy of encouraging home industries which made England mistress of the seas, and the dominator of the manufactures of all other countries. She was to repudiate the policy of our own foremost States—of Massachusetts, New York, Ohio, Illinois—a policy early adopted by them of aiding and encouraging agriculture and the mechanic arts, and a policy which has placed those States in the lead of all the other States of the Union. Yes, our own beloved California—the idol and the hope of genius and enterprise throughout the world—had turned her face backward upon the march of industrial improvement, had rejected the means by which the people had lifted themselves above the idleness, the ignorance, and the misery of the Middle Ages. The best men of the State were despondent. The members of the State Board of Agriculture were divided in council. The County and District Agricultural Societies were demoralized.

But the darkest hour of night is just before the break of day. There were a few men in the State who had not and would not cease to hope. A committee of the State Board of Agriculture, with discretionary powers, and with authority to act for the Board in the premises, were at work. Legal advice was sought and failed to point out any way by which the constitutional prohibition could be reconciled with the evident wishes of the people. The idea of making the State Board and State Society an exclusively State institution, was suggested; but against this action was urged the fear that it would thus become a political machine and lose its practical efficiency. More than half of the legislative session was past, and though there were many warm friends of the State and District Societies in both houses, no measure had been proposed looking to a satisfactory settlement of the industrial problem. At this juncture, two members of the Committee of the State Board of Agriculture—one a new and the other an old Constitution man, one a Democrat and the other a Republican—were holding night sessions. All the constitutional and political questions were thoroughly discussed, and so far as the committee were concerned, compromised and settled. It was agreed by this committee that one of the highest functions of a government is systematically to foster and encourage the industries which at once give food, intelligence, and civilization to the people.

It was also agreed by this committee that that patriotism that does not rise above party and look solely to the good and the welfare of the people, is not patriotism at all. It was further agreed and settled for all time to come, that no man is fit to fill the high office of Governor of the State of California who will allow his political bias or preferences to influence him in the selection and appointment of members of the State Board, or District Boards, of Agriculture, and that these appointments shall forever be made on account of the peculiar fitness of the appointees to discharge the responsible duties devolving upon them.

Mr. President, were this committee right in its conclusions? Well, so thought the Legislature, and by its solemn act placed upon the statute books laws indorsing and embodying these three fundamental principles. And all honor to Governor Perkins, that in his appointments of members of the State Board of Agriculture, and of the District Boards, he has never asked for the political faith of persons recommended, but has always insisted that the appointees should be men identified with and directly interested in the material industries of the State. The State Board of Agriculture is composed of twelve members, and each of the District Boards of eight members, and there being eleven District Boards, making the aggregate just one hundred appointees. And right here allow me to say, that from a pretty extensive acquaintance with the farmers, mechanics, and business men of the State, I ought to be a fair judge of the fitness and qualifications of the men who have been honored with these responsible positions by the appointment of the Governor. I can say, and do now say, that one hundred better men could scarcely be found in this or any other State. The manner in which they have taken hold of the work before them; the promptness with which they have organized the associations within their several districts; the interest they have enlisted among the people in behalf of these associations, and in the development and advancement of local industries; and above all, the unprecedented success which has attended the first annual fairs of the State and districts this Fall under their management, prove the entire correctness of our position, and the wisdom of the laws under which they have been organized.

As our State has natural advantages of climate and soil, and a more central location for the commerce of the world than any other State in the Union, so, by the wise laws of last Winter, it has a better industrial organization than any other State. By making our State Agricultural Society, and the eleven District Associations, State institutions, and the members of their Boards of Managers State officers, California has taken the lead of all her sister States in elevating the standard of the material industries, and recognizing the true dignity of labor. Agriculture and the mechanic arts in California to-day have a representation in the State Government of equal honor and equal dignity with the Department of State or the Executive Department. The Presidency of the State Agricultural Society of California is by our laws an office of equal dignity and honor and of equal importance with that of Governor. The Secretary of the State Board of Agriculture holds a position the responsibilities of which are measured by the magnitude of the State's material resources and the possible value of her producing industries. The several District Boards and their officers, within their limited jurisdictions, hold equally honorable and responsible positions.

The new California system for the encouragement and advancement of her industries is broad and comprehensive, embracing every foot of territory in the State, and every industry known to her people. The counties lying contiguous to each other, and offering the best facilities for concentrating their people and products at a common center, are grouped together in districts. Each district, as a rule, embraces a territory having a climate and soils peculiar to itself, and differing with the climates and soils of all the others. The general agricultural products of each district correspond to the peculiarities of its soils and climate. Each district, as a rule, has its local markets, and its distinct and separate modes of travel to general markets. Each district has, also, manufacturing industries peculiar to itself and its people. Thus, the counties composing the great southern inland valley of the San Joaquin constitute the Second District, and those lying within the great northern valley of the Sacramento constitute the Third District. These two districts embrace the great wheat-growing sections of the State; and yet they differ so much in climate and soil, and in the amount of annual rainfall, that the modes of cultivation, and the general systems for bringing each under a high state of development and production, must be entirely different. The coast and inland counties of the extreme north, being divided by an almost impassable range of mountains into three sections, are grouped in three separated districts; and these, again, have soils and climates and general products peculiar to each; and their markets and general interests are different; so that a system of agriculture adapted to one does not suit the other. Then the foothill counties of the Sierra Nevadas, and the coast-range counties, constituting the eastern and western sections of the central part of the State, are grouped into two districts; and while these districts embrace the great wine-producing sections of the State, the climate and soils of each are so different that varieties of grapes peculiarly adapted to wine-making in one district are not well adapted to the other, and the general management of the vineyard and manipulation of the wines of one district are required to be different from their management and treatment in the other. The central coast-range district embraces also the great dairy section of the State, and the dairy industries are carried on quite extensively in the Sierra foothills; but here, again, the management of this industry in the former district is quite different from the management required for the same industry in the latter. In Sonoma and Marin the butter-making season commences in February, and continues to June and July, while in El Dorado, Placer, and Amador it does not commence till May, and lasts till the snow drives the dairies from the high mountain pastures into the valleys below.

The same diversity of soil, and climate, and products, is to be found in the districts located on the bay, in the Santa Clara and Salinas Valleys, while the climate, soil, and products of the districts located at the extreme south of the State differ from the climate, soil, and products of the extreme north almost as widely as the climate, soil, and productions of Italy differ from those of Norway and Sweden, or of Florida from that of Maine.

Enough has been stated to show, that in dividing the State into agricultural districts, the dictates and suggestions of nature have been followed in fixing the lines and boundaries. If in the future it shall be deemed expedient to establish experimental stations over the State on the Germanic plan, the different agricultural districts will be very proper sections for their location, and the District Boards of Agriculture will be the proper authorities to take the general management of them. The experimental stations in Germany have been the principal agencies through which German agriculture has been brought to its high standard of perfection, increasing the annual production, and keeping up the great fertility of the soil. Similar stations in France have made French agriculture the most elastic and productive known in the world. These facts are suggestive of what such stations might bring about in each agricultural district in this State. At present, the District Boards of Agriculture are expected to encourage and stimulate local industries by collecting and disseminating among their people generally the lessons and practices learned and followed by the more successful stock breeders, agriculturists, horticulturists, vine growers and wine makers, mechanics and manufacturers, not only of their own districts, but of the State, nation, and the world. Experience in all countries and in all ages since the era of industrial improvement began, has proven that industrial fairs, properly conducted, are among the most efficient means of accomplishing these objects. These fairs present practical facts to the eye, and fix practical reasons in the mind. They are practical object-teaching schools, open alike to the rich and the poor; the high and the low; the learned and the unlearned; the young and the old.

Their language is universal. It is written in neither Hebrew, Greek, Roman, or German text. It requires none of the hieroglyphics of the ancient Egyptians, the word-conveying strokes and dots of the Chinese, or the enigmatic figures of the aborigines of Central and South America, to convey the lessons they are capable of teaching to the mind of the beholder. The thought, the idea, the principle, the truth, reaches and enlightens the understanding and remains a permanent impress upon the tablets of the mind.

The exhibition we see before us is sufficient exemplification of all we have said. One day spent on the stock ground yonder, and in this pavilion, is worth to the careful observer years of reading and close study of dry facts and chemical formulas.

Passing over the beautiful exhibitions of fancy and plain needlework, of ornamental and useful domestic industry, of dried and preserved fruits, and fragrant flowers, made by the misses and ladies of this district; passing over the magnificent display of green fruits and vegetables with which these tables are filled; passing over the agricultural implements, pumps, plows, lumber wagons, and carriages, all made by your own mechanics; passing over the long lists of thoroughbred, roadster, farm, and draught horses, Short-horn, Ayrshire, and Jersey cattle luxuriating in your stalls at the stock grounds, we desire to call especial attention to the almost invaluable exhibition of wheat we behold in this pavilion.

You have here no less than twenty-five varieties of wheat, all labeled with their correct names, and each bearing evidences of different characteristics and different properties. This wheat exhibition derives its great importance, not so much from any intrinsic merit in itself over other wheat exhibitions in other districts, as from the fact that this Agricultural District Number Three is the great wheat-growing district of the State. Within this district, comprised of the Counties of Sutter, Yuba, Butte, Colusa, Tehama, Yolo, and Sacramento, the four counties, Sutter, Butte, Colusa, and Yolo, are at once the most extensive and most reliable wheat-producing counties in the State. Of the seventeen million four hundred and fifty-one thousand one hundred and eighty-one bushels reported by the Assessors as the State's wheat product of eighteen hundred and seventy-nine, these four counties are credited with having produced eight million eight hundred and sixty-seven thousand three hundred and fifty-six bushels.

Of the thirty-three million bushels estimated as the product of the State for the present year, these four counties have produced nearly or quite half that amount, and adding the product of Yuba, Sacramento, and Tehama, the product of this district may be considerably over half the product of the entire State. In the light of this fact you will agree with me, Mr. President, in the statement that this wheat exhibit becomes a very important one. It opens up the whole wheat question in all its bearings for the serious consideration of the farmers of the district. The kind and change of seed, the mode of cultivating the soil, and time and manner of planting and covering the grain, the time and mode of harvesting and thrashing, the storage and time to sell, and finally the transportation to market, are all matters of great interest to these people.

First, the kind of seed. It is a universal rule in nature that "like produces like." The only exceptions to this rule are caused by controlling circumstances. It follows, therefore, that if we would produce good and paying crops, we must sow good seed, adapted to our soil and climate. In addition to this, we must produce the kind or style of wheat most in demand in the market where it is to be sold. England is and must be our principal market for a long time to come. The home-grown wheats of Great Britain are dark heavy glutinous wheats. So are the wheats of Russia and our own States of the great northern Mississippi Valley, from which England draws her largest supplies. These dark kinds of wheat make dark, heavy flour, and the English millers want lighter white wheat to mix with them to enliven the flour and make better bread. Our climate is peculiarly adapted to the growth of these white wheats most in demand in the English markets, where they are, without distinction as to our local names, termed "club wheat." Hence, in selecting our seed we should, as a rule, select the white varieties. The question of the best of these white varieties can only be settled by experiments in different localities. Outside of the College of Agriculture, from whose grounds were exhibited at the State Fair this year eighty-six varieties of wheat, a resident of this district and this county has the credit of conducting the most important experiments in wheat culture in the State. John Bidwell exhibited seventeen distinct varieties of wheat at the State Fair, and to two of these varieties, the Tuscany and the Genesee, a most competent committee of millers and farmers awarded the first premium. They also commended very highly the Propo Australian Club, and Sonora, exhibited by G. W. Colby, another farmer of this district and county, and the Tuscany and White Chili, exhibited by H. Cronkite, of Sacramento County. It is a well known fact that wheat will do much better when the seed is changed frequently, so as to vary the climate and soil. Later importations of seed from Australia, Chili, and from some European countries, have added very materially to the product of the State, even though the importations have been of the same varieties of seed as those they were imported to supplant. A change of climate is good for seed wheat as well as for sickly persons or animals. Next, as to cultivation. That Summer fallowing is the best system for this State is almost universally believed by our farmers. But will Summer fallowing alone keep up the fertility and productiveness of the soil? The great question in California wheat growing is, how best to keep up the fertility and productiveness of the soil. We know that it has been stated of late, from a high place, that the seasons, as well as the condition and fertility of the soil, have very much to do with the wheat crop of the State. While the experience of the present season may justify this statement in a limited sense, the inferences liable to be drawn from it are dangerous and deceitful in the extreme. If the statement was simply intended to convey the idea that soil, exhausted by cropping for a long series of years, will produce a much better crop in a favorable season than in an unfavorable one, we can fully indorse it. But if it was meant to sanction the false idea that California soil has an inexhaustible treasure of fertility in it—that California farmers can continue to take from their lands annual or even biennial crops of wheat, without exhausting their fertility and rendering their cultivation in wheat unprofitable and even ruinous—then we disagree with it in the most emphatic manner.

The experience of wheat growing in every country, since wheat has been cultivated by man as food for the human family, has been a disproof of this dangerous doctrine. The history of wheat growing in our own country has been a history of the exhaustion of the soil and a constant decrease in the average yield per acre. As the tide of immigration has swept over the United States from the Atlantic to the Rocky Mountains, it has, by too constant cropping of the soil in wheat, left behind it a country in which wheat culture is the least profitable occupation of the farmer. It has left behind it a soil exhausted of the natural ingredients of wheat—of the necessary elements of successful wheat culture. Why, sir, from the soil of this district has been produced this year five hundred thousand tons of wheat, and there will probably be shipped four hundred thousand tons from the district to Europe. Has this great crop taken nothing from the fertility of the soil? As well might it be asserted that from a gallon measure of milk you could pour a half gallon and still have a gallon of pure milk in the measure. The four hundred thousand tons of wheat will go from your district to Europe, and with it will as certainly go from your soil the necessary ingredients to produce just four hundred thousand tons of wheat, and unless you return to your farms, in some way, some of the ingredients extracted from them by this crop, your district will be just the value of this wheat the poorer as a wheat-growing district.

The importance of this subject has betrayed me into so extended a discussion of it that I shall be compelled to omit much that I intended to say upon the means of keeping up the fertility of the soil where wheat culture must necessarily be for many years the principal occupation of farmers. Our climate will not allow the practice of rotation of crops so successfully adopted in countries where a high temperature and moisture are united. We cannot plow in our straw, because it will not rot; we cannot resort to root crops, because they will not grow successfully on our dry wheat land; but we can raise stock to consume the straw and return it to the soil. We can produce, alternately, a crop of wheat and a crop of beef and butter, or mutton and wool, or pork and lard, and in this way we can not only make more money for ourselves in the long run, but what is equally as important, we can leave our children a valuable inheritance—a country worth having.

The time and mode of harvesting our wheat, Mr. President, is a matter of much greater importance than is generally supposed. It has been considered one of California's chief advantages, as a wheat-growing State, that her dry Summer climate favored the plan of allowing wheat to remain standing till it had become so ripe and dry that it could be cut with a header, and thrashed and stacked immediately without danger of heating and molding. That considerable is gained by this practice in the economy of handling the grain, and avoiding the handling of large bulks of straw, is evident, but have we not been losing in another way more than we have gained by this practice? There is a certain stage of ripeness or maturity when wheat has gained its greatest weight and best quality, and if cut at this stage, with the full length of straw, and allowed to remain in the straw in a position to harden up gradually, this weight and quality become fixed so as never to be lost. But if the grain be cut before this proper condition has been attained, the kernels shrink and wilt, and the meat or flour-making substance becomes tough and leathery, and there is a great loss both in weight and flour-making and food-producing qualities. The effect of cutting wheat too green is similar to that produced on the apple by plucking it from the tree too green. The nutritive juices that would otherwise go through a natural chemical change, making sugar and gluten, evaporate, leaving simply the shrunken form of the kernel without the life-giving and sustaining properties which are necessary to make good flour-producing wheat. On the other hand, if wheat be allowed to stand in the field uncut until it has passed the proper stage of ripeness, the effect in our dry climate is almost or quite as bad as that which results from cutting it too soon. Every farmer has experienced how detrimental it is to hay to allow it to stand uncut till over ripe. The leaves part with their substance, while the stems become brittle, and hard and woody, and lose nearly all the qualities that if cut at the proper time would go to make it good feed for stock.

The effect is precisely the same on wheat straw, while the berry loses its sugar and gluten and leaves only the form—the dry woody substance—with a material reduction in weight and milling value. These statements are not founded on mere conjecture, or theory, but have been substantiated by actual analyses and field experiments. It has been ascertained in this way that wheat will lose about eight per cent. of its highest weight by standing in the field beyond the proper time of cutting, or until it has arrived at the dead-ripe stage. Besides this, practical millers assert that it will lose about five per cent. in quality from the same cause. Estimated by these standards the loss to the wheat producers of this district has not been less this year than ten per cent. of the whole product of the district, or one million six hundred and fifty thousand bushels, at one dollar and twenty-five cents per one hundred pounds, equal to one million two hundred and thirty-seven thousand five hundred dollars; and the State has lost double that sum, or two million four hundred and seventy-five thousand dollars. This from shrinkage in weight and in quality. How much have we also lost by shelling out by winds and by cutting and hauling, consequent upon allowing our wheat to stand till over ripe?

These are questions for the serious consideration of our wheat growers, and we trust they will not dismiss them until they have decided upon practical remedies within the reach of all.

Farmers have been too negligent of late in cleaning their wheat; and we may also say that shippers have been too neglectful of the condition of wheat shipped. These things have had a very bad effect upon the reputation of our wheat in the markets of Europe, and have caused great damage to our local millers. The time was when California wheat stood at the top of the list of prices of all the wheats of the world. The carelessness of which we have spoken has had the effect to drop the quotations and prices of California wheat in the Liverpool market from the first to the third and fourth on the list, thus resulting in great damage to the growers. Our former proud position can only be regained by extra care in cleaning on the part of the farmers, and extra care in grading and mixing on the part of shippers.

The matter of storage, and time to sell, we will dismiss, with the single remark, that the farmer who has a large crop of wheat on hand without the means of covering it from the weather at this season of the year, has already almost as good as lost half the profits of production; he has given himself away to the wheat speculator, who always stands ready to take advantage of his necessities. And the farmer who has a large crop to sell, and has not, independent of the dealers, the necessary statistical information to enable him to judge of the relative demand and supply in the world, is in equally as unsatisfactory a condition; he is a mere "hewer of wood and drawer of water" to those who, having the necessary information and the money, manipulate the wheat market and handle the wheat, and gobble up the lion's share of the profits.

But, Mr. President, we come now to the last, and perhaps the most important, subject connected with this wheat business. We refer to the subject of transportation—and first, of transportation to tide-water. Before we can load sea-going vessels with wheat, we must convey it to a point where these vessels can come to receive it. For this purpose, and without cost to us or any one else, Nature has produced a great free highway, upon which the farmers of this district may convey their wheat to tide-water at the very least possible expense. The noble Sacramento divides the district in the center, and was intended by Nature's God as an everlasting inheritance to the farmers of Central and Northern California. As if to thwart this intention, however, the great pioneer industry of the State—the mining industry—has taken possession of, and become the owner of the mountains at the headwaters of all the tributaries of this noble river, and is washing these mountains down through these tributaries with a rapidity that threatens its usefulness as a means of transportation at a very early day.

It is true that a company of men who have built nearly all the railroads of the State, and who now control the railroad system of the entire coast, have, with characteristic foresight and enterprise, built roads on either side of the river connecting with the sea, and will be able to carry forward all the wheat that can be produced in the district for all time to come. Could these roads carry this wheat to tide-water and bring return freights back as cheaply as the same work could be done by water, they would in a measure compensate the farmers for the loss of the river as a highway; but they cannot do it. We are not informed as to the exact difference in cost of freight by the roads and the river, but if we assume it to cost two dollars per ton more by the railroads than by the river on all down and up freight, we presume we shall not miss the truth very far. We will, however, suppose it to be one dollar. Upon this supposition, we may estimate approximately the value of the river as a highway to the wheat farmers of the district. We have stated that there would be exported about four hundred thousand tons of wheat from the district this year. One dollar per ton on this will be a saving of four hundred thousand dollars on wheat freights alone. Assuming that all other freights, both down and up, between the district and the sea are equal to the tonnage on wheat down, the annual value of the river as a highway to the district, would be eight hundred thousand dollars. In ten years it would amount to eight million dollars, and the ultimate value would be incalculable. With these facts before them, will the people of Agricultural District Number Three allow the Sacramento, as a navigable river, to be destroyed? We think not. The general interests of the State would doubtless be subserved by a perpetuity of both the mining and farming industries, and we trust and hope that they may both be perpetuated, but the Sacramento, as a navigable stream and competing freight route, should be preserved in any event. The wheat farmers of this district, in common with the wheat farmers of all other sections of the

State, are greatly interested in the transportation of wheat beyond the State to the wheat markets of Europe. The present transportation route from San Francisco to Europe is equal to more than two thirds the distance around the earth, and the time required for a vessel to make the round trip is, on an average, about half a year. This places California at a disadvantage as compared to every other country supplying that market. We cannot take advantage of any rise in the market, for the wheat from other countries comes in ahead of ours and supplies the demand. Then, a large crop in California is generally followed by a corresponding scarcity of available tonnage, and high freights. The present situation is an illustration in point. Ten dollars per ton on wheat to Liverpool is a paying business to ship owners. The price demanded at this time is seventeen dollars and a half. This over-price of freight reduces the value of our wheat seven dollars and a half per ton in San Francisco. Instead of one dollar and thirty cents per cental at San Francisco, wheat should to-day be worth one dollar and sixty-seven and a half cents per cental, and would be with freights at ten dollars per ton instead of seventeen dollars and a half. This would be a paying and satisfactory price to farmers, and would make a difference to the wheat farmers of this district of more than three million dollars on the present crop, and more than six million one hundred thousand dollars on the whole crop of the State.

No facts or figures could illustrate more forcibly the importance of a competitive route for the transportation of our wheat to market. The Southern Pacific Railroad Company has realized this great need, and is rapidly pushing the work on that road to supply it. This road completed and in running order, we have reason to hope that high prices for freight will no longer be allowed, and that the profits of producing wheat in California will become certain and satisfactory. We will then be ten thousand miles nearer Liverpool, and in a situation to compete with other wheat-supplying countries for the best prices.

We look also to this new route for a revolution in the mode of handling wheat, that farmers will be relieved of the expense of sacks, and that wheat will be handled in bulk and by machinery at a much less cost than it is possible to handle it under the present system. The effect of opening up this new route of commerce between the Pacific and the continent of Europe will be equally advantageous to all the other products of our soil. Many articles that have now but a limited and fluctuating home market, will then find a constant foreign demand at remunerative prices. A brighter day is in the near future for the farmers of California. Let us be fully prepared to reap the golden harvest that awaits us.

FINANCIAL REPORTS.

Receipts.

By advertisement in premium list book	$182 50
Member tickets, 328	984 00
One ticket, $1 paid at door	2 00
Day tickets, 633	316 50
Park day tickets, 1,131	565 50
Hack badges, 2	4 00
Subscription of E. C. Nichols	25 00
Vending at park, per Martin	40 00
Sweepstakes on horses	10 00

Premiums Donated.

T. H. Barnard	10 00
C. C. Mason	10 00
J. J. Reavis	25 00
A. B. Collins	57 50
E. C. Nichols	5 00
Tickner, Burham & Co	20 00
Woods & Walker	12 00
P. Peters & Bro	7 00
Hibbard & Sommer	5 00
Donation of I. N. Hoag	20 00
State warrant	1,500 00
Total	$3,801 00

EXPENDITURES.

At Hall.

Cash paid out per vouchers:

Postage	$17 00
Stationery	30 20
Employés wages	169 25
Printing	166 17
Printing posters	37 15
Printing diplomas	135 00
Posting bills	3 00
Prizes, ladies' riding tournament	45 15
Building shed on hall	30 00
Attending to gas	10 00
Livery hire	4 00
Ribbon	19 40
Canvassing for advertisements	20 00
Sweeping hall	6 00
Express and drayage	4 40
Rent of chairs	3 50
Association seal	7 50
Half of gate money at Park to Jockey Club	282 75
Donation to Jockey Club for purses	194 75
Rent of hall	250 00
Band for week	200 00
Sundries	19 25
Sprinkling streets	12 00
Chico Gas Company	48 50
Chico Water Company	58 75
Napkin rings	12 75
Delivering address	20 00
Secretary, salary	150 00
Discount on State warrant	30 00
Premiums paid	934 00
Total	$2,920 53

Park.

Removal and reconstruction of stock sheds	$558 60
Labor and oil	9 50
Employés wages	81 00
Hay	102 13
Straw	23 00
Sundries	42 19
Total	$816 41
Grand total	$3,736 94
Balance in treasury	$64 06

All of which is respectfully submitted.

W. S. ELIOT, Secretary.

REPORT OF THE TREASURER.

To the honorable Board of Directors of the District Agricultural Association No. 3:

Gentlemen: The undersigned, Treasurer of your Association, begs leave to report as follows:

Cash received from Secretary	$3,801 00
Vouchers paid	3,736 94
Balance in treasury	$64 06

Respectfully submitted.

CHARLES FAULKNER, Treasurer.

Chico, California, October 30, 1880.

EXHIBITS AT THE FAIR—1880.

ENTRIES AT THE PARK.

FIRST DEPARTMENT—FIRST DIVISION—LIVE STOCK.

HORSES. CLASS III.—THOROUGHBRED HORSES.

Age.	Name.	Owner.	P. O. Address.
	STALLIONS.		
15 years	Telegraph	J. D. Keesicker	Chico.
	MARES.		
4 years	Blue Bonnet	J. D. McIntosh	Chico.
15 years	Little Bay	J. D. McIntosh	Chico.

CLASS II.—GRADED HORSES.

Age.	Name.	Owner.	P. O. Address.
	STALLIONS.		
3 years	Johnny	Mat. Schwein	Chico.
12 years.	Blackbird	J. J. Reavis	Chico.
4 years	Snap	John Fay	Princeton.
1 year	Billy	L. L. Daniels	Chico.
	Blackbird and family		
6 years	Ned Forrest		
4 years	Ellie Rhee		
1 year	Delphine		
1 year	Farewell		
1 year	No Name		
	MARES.		
3 years	Rosie	Mat. Schwein	Chico.
4 years	Lucy Long	J. D. Keesicker	Chico.
5 years	Sage Hen	J. D. Keesicker	Chico.
6 years	Elaine	J. T. McIntosh	Chico.
5 years	Orland Baby	Jas. Prout	Orland.

CLASS III.—HORSES OF ALL WORK.

Age.	Name.	Owner.	P. O. Address.
	STALLIONS.		
7 years	George	H. Mooney	Tehama.
	MARES.		
6 years	Fly	M. Wick	Oroville.

CLASS IV.—DRAFT HORSES.

Age.	NAME.	Owner.	P. O. Address.
	STALLIONS.		
9 years	Uncle Sam	A. B. Collins	Chico.
4 years	Bloomington	J. J. Reavis	Chico.
	MARES.		
7 years	Lou	M. Wick	Oroville.

CLASS V.—ROADSTERS.

Age.	NAME.	Owner.	P. O. Address.
	STALLIONS.		
5 years	Prompter	J. T. McIntosh	Chico.
5 years	St. Elmo	E. C. Nichols	Chico.
2 years	Singleton	J. T. McIntosh	Chico.
	GELDINGS.		
6 years	Ned Forrest	J. J. Reavis	Chico.
	MARES.		
4 years	Rena	J. T. McIntosh	Chico.
4 years	Ellie Rhee	J. J. Reavis	Chico.

CLASS VI.—CARRIAGE HORSES.

Age.	NAME.	Owner.	P. O. Address.
	DOUBLE.		
6 years	Mattie Solomon	B. F. Allen	Pentz.
8 years	Nig	B. F. Allen	Pentz.
7 years	Grant	T. H. Barnard	Chico.
8 years	Dublin	T. H. Barnard	Chico.
	SINGLE.		
5 years	May	J. J. Waste	Chico.
6 years	Clint	L. H. McIntosh	Nord.

CLASS VII.—ROADSTER TEAMS.

Age.	NAME.	Owner.	P. O. Address.
	DOUBLE.		
3 years	Lottie	L. H. McIntosh	Nord.
3 years	Lettie	L. H. McIntosh	Nord.
13 years	Fanny	C. C. Mason	Chico.
13 years	Mack	C. C. Mason	Chico.

CLASS VIII.—SADDLE HORSES.

Age.	NAME.	Owner.	P. O. Address.
6 years	Maud	J. T. McIntosh	Chico.
4 years	Belle	L. H. McIntosh	Nord.

CLASS IX.—YEARLING AND SUCKING COLTS.

Age.	Name.	Owner.	P. O. Address.
1 year	La Harp	J. T. McIntosh	Chico.
Sucking.	Stanley	J. T. McIntosh	Chico.
Sucking.	Elsie	J. T. McIntosh	Chico.
Sucking.	Nellie	J. T. McIntosh	Chico.
Sucking.	Farewell	J. J. Reavis	Chico.
Sucking.	Delphine	J. J. Reavis	Chico.
Sucking.	Prince	L. H. McIntosh	Nord.
Sucking.	Major	L. H. McIntosh	Nord.

CLASS X.—SWEEPSTAKES.

Age.	Name.	Owner.	P. O. Address.
	STALLIONS.		
2 years	Singleton	J. T. McIntosh	Chico.
12 years	Blackbird	J. J. Reavis	Chico.
	MARES.		
4 years	Bessie	J. T. McIntosh	Chico.
4 years	Ellie Rhee	J. J. Reavis	Chico.

CLASS XI.—JACKS AND MULES.

Age.	Name.	Owner.	P. O. Address.
6 years	Kentucky Prince	H. B. Collins	Chico.
8 years	Humboldt	J. J. Reavis	Chico.

FIRST DEPARTMENT—SECOND DIVISION—LIVE STOCK.

CATTLE. CLASS I.—DURHAM CATTLE.

Age.	Name.	Owner.	P. O. Address.
	BULLS.		
3 years	Mayor Butler	M. Wick	Oroville.
2 years	Cottonwood	M. Wick	Oroville.
9 mos.	Golden Wreath	M. Wick	Oroville.
5 mos.	Garfield	M. Wick	Oroville.
2 years	Middleton	J. J. Reavis	Chico.
1 year	Twilight	J. J. Reavis	Chico.
	COWS.		
4 years	Gem	M. Wick	Oroville.
4 years	Venus	M. Wick	Oroville.
4 years	Ruby	M. Wick	Oroville.
4 years	Frantic Louan 1st.	M. Wick	Oroville.
2 years	Frantic Louan 6th.	M. Wick	Oroville.
1 year	Frantic Louan 12th.	M. Wick	Oroville.
1 year	Frantic Louan 13th.	M. Wick	Oroville.
1 year	Frantic Louan 14th.	M. Wick	Oroville.
1 year	Frantic Louan 19th.	M. Wick	Oroville.
8 mos.	Frantic Louan 22d.	M. Wick	Oroville.
8 mos.	Frantic Louan 23d.	M. Wick	Oroville.
6 mos.	Matilda	M. Wick	Oroville.
	DEVON.		
3 mos.	Hawkins	A. B. Collins	Chico.

CLASS II.—GRADED CATTLE.

Age.	Name.	Owner.	P. O. Address.
	BULLS.		
7 mos.	Tim.	A. B. Collins	Chico.
	COWS.		
5 years	Minnie	A. B. Collins	Chico.
5 years	Kate	T. H. Barnard	Chico.

FIRST DEPARTMENT—THIRD DIVISION—LIVE STOCK.

SHEEP, GOATS, SWINE, AND POULTRY. CLASS I.—THOROUGHBRED SHEEP.

Age.	Name.	Owner.	P. O. Address.
	SPANISH MERINO.		
2 years	Surprise	J. H. Strowbridge	Hayward.
	Six Spring lambs	J. H. Strowbridge	Hayward.
	Six ewes	J. H. Strowbridge	Hayward.
1 year	Duke	L. H. McIntosh	Nord.
1 year	Long Wool	L. H. McIntosh	Nord.
1 year	Five ewes	L. H. McIntosh	Nord.

CLASS II.—GOATS.

Age.	Name.	Owner.	P. O. Address.
	ANGORA.		
3 years	Scotchman 1st.	M. Wick	Oroville.
1 year	Scotchman 2d.	M. Wick	Oroville.
9 mos.	Scotchman 3d.	M. Wick	Oroville.
6 mos.	Scotchman 4th.	M. Wick	Oroville.
3 years	Lilly	M. Wick	Oroville.
2 years	Lucy	M. Wick	Oroville.
2 years	Fanny	M. Wick	Oroville.
	Four kids	M. Wick	Oroville.

CLASS III.—SWINE.

Age.	Name.	Owner.	P. O. Address.
	BERKSHIRE BOARS.		
10 mos.	Comstock	M. Wick	Oroville.
9 mos.	Parker	J. H. Guill	Chico.
1 year	Reno	A. B. Collins	Chico.
	SOWS.		
9 mos.	Bess of Butte	J. H. Guill	Chico.
1 year	Princess	A. B. Collins	Chico.
1 year	Belle	A. B. Collins	Chico.
	CHINA POLAND BOARS.		
3 mos.		M. Wick	Oroville.
3 mos.	Silver Spar	J. D. Keesicker	Chico.
	SOWS.		
3 mos.		M. Wick	Oroville.
3 mos.		M. Wick	Oroville.
8 mos.		J. D. Keesicker	Chico.

CLASS IV.—POULTRY—PURE BRED.

Breed.	Owner.	P. O. Address.
Brown Leghorns	J. H. Guill	Chico.
Brown Leghorns	A. B. Collins	Chico.
Brown Leghorns	D. M. Hooper	Chico.
White Leghorns	J. H. Guill	Chico.
White Game	J. H. Guill	Chico.
Irish Game	J. F. Holland	Chico.
Black-Breasted Game	J. F. Holland	Chico.
Black Game	A. B. Collins	Chico.
Pile Game	A. B. Collins	Chico.
Duck Wing Game	J. F. Holland	Chico.
Japanese Bantams	J. H. Guill	Chico.
Dominique	J. H. Guill	Chico.
Dominique	D. M. Hooper	Chico.
Dominique	C. C. Goree	Chico.
Plymouth Rock	J. H. Guill	Chico.
Plymouth Rock	J. F. Holland	Chico.
Houdan	J. F. Holland	Chico.
Black Cochin	A. B. Collins	Chico.
Silver Poland	A. B. Collins	Chico.
Golden Poland	A. B. Collins	Chico.
Black Spanish	C. C. Goree	Chico.
Black Spanish	J. F. Holland	Chico.
Langshans	B. F. Allen	Pentz.
Bronze turkeys	J. F. Holland	Chico.
Pekin ducks	A. B. Collins	Chico.

SECOND DEPARTMENT—FIRST DIVISION.

Article.	Exhibitor.	P. O. Address.
CLASS I.—AGRICULTURAL MACHINERY.		
Little Chief fanning mill	C. L. Stilson & Co.	Chico.
Nash & Cutts fanning mill	C. L. Stilson & Co.	Chico.
Nash & Cutts fanning mill	Hubbard & Earll	Chico.
Ladou pulverizing harrow	C. L. Stilson & Co.	Chico.
McCormick mower	C. L. Stilson & Co.	Chico.
Calhoun seed sower	C. L. Stilson & Co.	Chico.
Spring tooth harrow	W. C. Stevens	Chico.
Patent gate	L. H. McIntosh	Nord.
Wheat cleaner	T. Alpaugh	Orland.
Furst & Bradley plow	C. L. Stilson & Co.	Chico.
Two-gang plow, California manufacture	Hubbard & Earll	Chico.
Star (Moline) plow	Hubbard & Earll	Chico.
One fourteen-inch single plow	Graf & Johnson	Chico.
One twelve-inch single plow	Graf & Johnson	Chico.
One sixteen-inch single plow	Graf & Johnson	Chico.
One ten-inch gang bottom plow	Graf & Johnson	Chico.

SPECIALTIES.

Article.	Exhibitor.	P. O. Address.
Portable hen house	J. H. Guill	Chico.
Span of colts	Matt. Schwein	Chico.
Large cow	Matt. Schwein	Chico.
Span of colts	L. H. McIntosh	Nord.
Draft gelding	H. Mooney	Tehama.

ENTRIES AT PAVILION.

SECOND DEPARTMENT.

Name.	Article.	Address.
CLASS I.		
T. Losee	Farm gate	Nord.
R. C. Padan	Spinning wheel	Chico.
Isaac Small	Clothes horse	Chico.
Hallet & Loy	Sewing machine	Chico.
J. V. Flint	Sewing machine	Chico.
C. H. Taylor	Grain saving attachment	Chico.
E. C. Nicholls	Farm gate	Chico.
T. M. Lash	Fruit gatherers	Sacramento.
T. M. Lash	Lawn sprinkler	Sacramento.
T. M. Lash	Well force pump	Sacramento.
Hubbard & Earll	Well force pump	Chico.
CLASS II.		
C. L. Stilson & Co	Farm wagon	Chico.
H. M. Bernard	Two-horse family carriage	Sacramento.
H. M. Bernard	One-horse family carriage	Sacramento.
H. M. Bernard	Track sulky	Sacramento.
H. M. Bernard	Carriage springs	Sacramento.
R. F. Briggs & Co	Two-seated open carriage	San Francisco.
R. F. Briggs & Co	Four-spring market wagon	San Francisco.
R. F. Briggs & Co	Lady's phæton	San Francisco.
R. F. Briggs & Co	Top buggy	San Francisco.
R. F. Briggs & Co	One-horse family carriage	San Francisco.
R. F. Briggs & Co	Track sulky	San Francisco.
R. F. Briggs & Co	Top umbrella	San Francisco.
Joseph Eddy	Two-horse top buggy	Chico.
Thomas Alpaugh	Wheat cleaner	Orland.

THIRD DEPARTMENT.

Name.	Article.	Address.
CLASS I.		
J. F. Watkins & Co	Display of dry goods	Chico.
J. F. Watkins & Co	Display of fancy goods	Chico.
J. F. Watkins & Co	Display of carpets and rugs	Chico.
Mrs. D. M. Hooper	Gentleman's shirt	Chico.
Mrs. D. M. Hooper	Knit stockings	Chico.
Mrs. W. McKay	Foot mats	Powelton.
Hallet & Loy	Carpets and rugs	Chico.
L. A. Hildreth	Foot mat	Chico.
J. F. Entler	Rag carpet	Chico.
Mrs. J. S. Padan	Stocking yarn	Chico.
Mrs. J. S. Padan	Knit stockings	Chico.
Woods & Walker	Gent's shirts	Chico.
Woods & Walker	Cloths	Chico.
Tickner, Burnham & Co	Dry goods	Chico.
Tickner, Burnham & Co	Fancy goods	Chico.
Tickner, Burnham & Co	Carpets and rugs	Chico.
Joe Franey	Cloths	Chico.
CLASS II.		
C. E. White	Wreath of flowers	Chico.
C. C. Goree	Crochet trimmings	Chico.
Miss J. Daniels	Patchwork quilts	Chico.
Miss J. Daniels	Handworked quilt	Chico.

Third Department—Continued.

Name.	Article.	Address.
Joseph Davidson	Knit buggy robe	Chico.
C. E. White	Artificial flowers	Chico.
Miss Emma Knox	Air castle	Chico.
Mrs. Dr. J. T. Jackson	Crocheted shawl	Chico.
Mrs. Dr. J. T. Jackson	Shawl from India	Chico.
Miss Ida Parr	Fine lace work	Chico.
Miss Ida Parr	Crocheted tidies	Chico.
Miss Anna Parr	Worsted tidies	Chico.
Miss B. Patrick	Crocheted tidies	Chico.
Miss B. Patrick	Canvas tidies	Chico.
Miss B. Patrick	Cornucopia	Chico.
Miss B. Patrick	Worsted worked motto	Chico.
Miss B. Patrick	Ornamental needlework	Chico.
Mrs. M. N. Salmon	Hand-sewed child's dress	Chico.
Miss B. Patrick	Pincushion	Chico.
Mrs. W. T. Tuckwell	Patchwork quilt	Chico.
Mrs. W. F. Locey	Wax flowers	Chico.
Mrs. Levi Smith	Patchwork quilt	Chico.
Miss Sadie Hoyle	Crotcheted tidies	Chico.
L. A. Hildreth	Patchwork quilt	Chico.
L. A. Hildreth	Lace work	Chico.
L. A. Hildreth	Chair cushion and back	Chico.
Miss Carrie Foster	Ornamental needlework	Chico.
Miss Carrie Foster	Patchwork sofa cushion	Chico.
Mrs. J. H. Guill	Flower work	Chico.
Miss Edith Beasley	Pincushion	Chico.
Mrs. D. T. Hicks	One tidy	Chico.
Mrs. J. C. Glover	Braidwork	Sacramento.
Miss Lena Padan	Fly brush (peacock feathers)	Chico.
Miss Lena Padan	Lace work	Chico.
Miss Lena Padan	Pillowcase	Chico.
Mrs. F. S. Bailey	Silk embroidery	Chico.
Miss Lena Padan	Lace tie	Chico.
Miss Lena Padan	Toilet set	Chico.
Mrs. G. W. Dorn	Skeleton leaves	Chico.
Mrs. George Peck	Moss work	Chico.
Mrs. George Peck	Crocheted tidies	Chico.
Mrs. George Peck	Shell work	Chico.
Mrs. J. T. Johnston	Ottoman cover	Chico.
Mrs. J. T. Johnston	Artificial flowers	Chico.
Mrs. J. T. Johnston	Lace work	Chico.
Mrs. J. F. Entler	Child's knit gloves	Chico.
Mrs. W. C. Stevens	Crocheted tidies	Chico.
Woods & Walker	Men's and boys' clothing	Chico.
Woods & Walker	Custom suit	Chico.
Woods & Walker	Furnishing goods	Chico.
Woods & Walker	Knights Templars regalia	Chico.
Mrs. B. F. True	Silk quilt	Chico.
Miss Mattie Crosette	Chenille work	Chico.
Miss Mattie Crosette	Linen embroidery	Chico.
Miss Nora Peck	Moss work	Chico.
Joe Franey	Custom coats and vests	Chico.
Mrs. J. McFeely	Embroidered shawl	Chico.
J. C. Broyies	Embroidered flannel	Chico.
Mrs. John Byers	Shell work	Chico.
Mrs. John Byers	Moss work	Chico.

JUVENILE DEPARTMENT.

Name.	Article.	Address.
Miss Melinda Goree	Knit woolen stockings	Chico.
Miss Melinda Goree	Hair wreath	Chico.

FOURTH DEPARTMENT.

Name.	Article.	Address.
CLASS I.		
Hallet & Loy	Paper hangings and borders	Chico.
Woods & Walker	Silk hat	Chico.
Woods & Walker	Soft hat	Chico.
P. Peters & Bro.	Dress boots	Chico.
P. Peters & Bro.	Men's and boys' boots and shoes	Chico.
P. Peters & Bro.	Ladies' and girls' boots and shoes	Chico.
CLASS II.		
R. H. McDonald	Hand-sewing needles	Chico.
Charles Ball	Silverware	Chico.
Charles Ball	Table cutlery	Chico.
Charles Ball	Clocks	Chico.
Hubbard & Earll	Hardware	Chico.
Hubbard & Earll	Gas fixtures	Chico.
Hubbard & Earll	Mechanics' tools	Chico.
Hubbard & Earll	Agate ware	Chico.
Hibbard & Summer	Clocks	Chico.
Hibbard & Summer	Silverware	Chico.
Hibbard & Summer	Celluloid goods	Chico.
Hibbard & Summer	Irridescent glassware	Chico.
Hibbard & Summer	Gold-headed canes	Chico.
CLASS III.		
Hubbard & Earll	Cooking stoves	Chico.
Hubbard & Earll	Ranges	Chico.
CLASS IV.		
Blood & Flint	Musical instruments	Chico.
Blood & Flint	Piano	Chico.
Blood & Flint	Organ	Chico.
CLASS V.		
Hallet & Loy	Dressing bureau	Chico.
Hallet & Loy	Sofa	Chico.
Hallet & Loy	Extension table	Chico.
Hallet & Loy	Parlor chairs	Chico.
Hallet & Loy	Parlor furniture	Chico.
Hallet & Loy	Display of furniture	Chico.
Hallet & Loy	Wardrobe	Chico.
Hallet & Loy	Sick chair	Chico.
Hallet & Loy	School furniture	Chico.
Hallet & Loy	Bedroom furniture	Chico.
Hallet & Loy	Undertakers' goods	Chico.
L. A. Hildreth	Parlor chair	Chico.
George H. Fuller	School furniture	Chico.
George H. Fuller	Folding settee	Chico.
George H. Fuller	Store stools	Chico.
CLASS VI.		
A. F. Blood	Brooms, broom corn, and brushes	Chico.
CLASS VIII.		
Mrs. H. M. Bunnell	French laundry blueing	Durham.
C. C. Goree	Hand made soap, soft	Chico.
C. C. Goree	Hand made soap, hard	Chico.
Mrs. A. E. McInespy	Hand made soap, soft	Chico.
G. W. Turner	Ink	Chico.
Mrs. J. F. Entler	Hand made soap, hard	Chico.
Tickner, Burnham & Co.	Display of soap	Chico.
Royal Baking Powder Co.	Yeast powder	Chico.
CLASS X.		
W. L. Bradley	Dressed marble	Chico.

Fourth Department—Continued.

Name.	Article.	Address.
CLASS XI.		
J. M. Hill	Minerals, etc.	Chico.
J. M. Hill	Ornithological collection	Chico.
J. M. Hill	Old coins	Chico.
W. Proude	Ornithological collection	Chico.
J. C. Broyles	Coral	Chico.

FIFTH DEPARTMENT.

Name.	Article.	P. O. Address.
CLASS I.		
J. H. Guill	Tuscany wheat	Chico.
J. H. Guill	Winter barley	Chico.
J. G. Neubarth	California cigars	Chico.
John Bidwell	Flour	Chico.
John Bidwell	Barley	Chico.
John Bidwell	Oats	Chico.
John Bidwell	Corn meal	Chico.
John Bidwell	Corn	Chico.
John Bidwell	Tobacco	Chico.
John Bidwell	White California wheat	Chico.
John Bidwell	Tuscany wheat	Chico.
John Bidwell	Winter gold dust wheat	Chico.
John Bidwell	Macaroni wheat	Chico.
John Bidwell	Silver chaff wheat	Chico.
John Bidwell	Propo wheat	Chico.
John Bidwell	German wheat	Chico.
John Bidwell	White club wheat	Chico.
John Bidwell	Australian blue stem wheat	Chico.
John Bidwell	Champlain wheat	Chico.
John Bidwell	Defiance wheat	Chico.
John Bidwell	Mold's red Winter wheat	Chico.
John Bidwell	Australian wheat	Chico.
John Bidwell	Odessa wheat	Chico.
John Bidwell	New prolific wheat	Chico.
John Bidwell	Pride of Butte wheat	Chico.
John Bidwell	Red nameless wheat	Chico.
John Bidwell	Irish barley	Chico.
John Bidwell	Nepal barley	Chico.
John Bidwell	Egyptian white corn	Chico.
John Bidwell	Rye	Chico.
CLASS II.		
John Bidwell	Lima beans in pod	Chico.
John Bidwell	Other beans in pod	Chico.
John Bidwell	Cabbage	Chico.
John Bidwell	Salsify	Chico.
John Bidwell	Sweet potatoes	Chico.
John Bidwell	Beets	Chico.
John Bidwell	Carrots	Chico.
John Bidwell	One package tomatoes	Chico.
John Bidwell	Pickling peppers	Chico.
John Bidwell	Marrow squashes	Chico.
John Bidwell	Hubbard squashes	Chico.
John Bidwell	Crookneck squashes	Chico.
John Bidwell	Pumpkins	Chico.
John Bidwell	Sweet corn	Chico.
John Bidwell	Watermelons	Chico.
John Bidwell	Muskmelons	Chico.
John Bidwell	Cucumbers	Chico.
John Bidwell	Purple egg plants	Chico.

FIFTH DEPARTMENT—Continued.

NAME.	Article.	Address.
J. C. Moore	Blood beets	Chico.
J. C. Moore	Pumpkin	Chico.
L. H. McIntosh	Tomatoes	Chico.
CLASS III.		
John Bidwell	Collection of plants	Chico.
CLASS V.		
J. H. Guill	Butter	Chico.
C. E. White	Domestic bread	Chico.
John Bidwell	Wheat bread	Chico.
David Reid	Butter	Chico.
Miss Matie Fritz	Soda biscuit	Chico.
Miss Ama Baeham	Wheat bread	Chico.
Mrs. J. F. Entler	Domestic bread	Chico.
Mrs. J. F. Entler	Salt-rising bread	Chico.
Mrs. J. F. Entler	Brown bread	Chico.
Mrs. J. F. Entler	Soda biscuit	Chico.
Mrs. J. F. Entler	Biscuit	Chico.
Mrs. J. F. Entler	Corn bread	Chico.
Mrs. S. F. Walker	Corn bread	Chico.
Mrs. S. F. Walker	Brown bread	Chico.
Mrs. S. F. Walker	Wheat bread	Chico.
Mrs. S. F. Walker	Soda biscuit	Chico.
Miss Carrie Messer	Brown bread	Chico.
Miss Carrie Foster	Salt-rising bread	Chico.

SIXTH DEPARTMENT.

NAME.	Article.	Address.
CLASS I.		
J. C. Moore	Apples, six varieties	Chico.
John Bidwell	Apples	Chico.
John Bidwell	Apples, twelve varieties	Chico.
Wm. Boness	Apples, twelve varieties	Chico.
Wm. Boness	Apples, six varieties	Chico.
John Bidwell	Pears	Chico.
John Bidwell	Pears, twelve varieties	Chico.
Wm. Boness	Pears, three varieties	Chico.
John Bidwell	Peaches	Chico.
John Bidwell	Peaches, one variety	Chico.
W. Z. King	Peaches	Chico.
Wm. Boness	Peaches	Chico.
J. H. Guill	Plums, one variety	Chico.
J. H. Guill	Plums	Chico.
John Bidwell	Plums	Chico.
John Bidwell	Pomegranates	Chico.
John Bidwell	Green figs	Chico.
CLASS II.		
W. H. Fritz	Pear preserves	Chico.
W. H. Fritz	Sweet pickles	Chico.
W. H. Fritz	Apple jelly	Chico.
Geo. W. Turner	Crab-apple pickles, Siberian	Chico.
C. C. Goree	Blackberry jelly	Chico.
John Bidwell	Preserves	Chico.
W. H. Fritz	Blackberry jelly	Chico.
Mrs. A. E. McInespy	Plum butter	Chico.
Mrs. A. E. McInespy	Tomato catsup	Chico.
Mrs. A. E. McInespy	Grape jelly	Chico.

Sixth Department—Continued.

Name.	Article.	Address.
J. Bidwell	Fruit in glass	Chico.
A. F. Blood	Pickled olives	Chico.
Mrs. W. N. Tupen	Preserves in glass	Chico.
Mrs. W. N. Tupen	Pickles	Chico.
Mrs. W. N. Tupen	Fruit in glass	Chico.
Mrs. J. F. Entler	Blackberry jelly	Chico.
Mrs. J. F. Entler	Quince jelly	Chico.
Miss Emma Henry	Display of jellies	Chico.
Geo. Parr	Honey	Chico.
CLASS IV.		
Geo. W. Turner	Dried figs	Chico.
Geo. W. Turner	Wine vinegar	Chico.
Geo. W. Turner	Pit plum tree	Chico.
Chico Box Factory	Packages for shipping fruit	Chico.
John Bidwell	Raisins	Chico.
John Bidwell	Grapes	Chico.
John Bidwell	English walnuts	Chico.
John Bidwell	Soft shell almonds	Chico.
A. F. Blood	Soda water and syrups	Chico.
John Bidwell	Dried apples	Chico.
John Bidwell	Dried plums	Chico.
John Bidwell	Dried figs	Chico.
Mrs. Allen Henry	Wine grapes	Chico.
Mrs. Allen Henry	Table grapes	Chico.
W. B. Groves	Quinces	Chico.

SEVENTH DEPARTMENT.

Name.	Article.	Address.
CLASS I.		
B. L. Compton	Pencil and pen drawings	Chico.
Miss Annie Rinehart	Pen and crayon drawings	Chico.
Miss Alice Rinehart	Pen and pencil drawings	Chico.

PREMIUMS AWARDED.

FIRST DEPARTMENT—LIVE STOCK—HORSES.

CLASS I.—THOROUGHBREDS.

Best mare, three years old, owned by J. T. McIntosh, $15.
Second best mare, three years old, owned by J. T. McIntosh, $10.

CLASS II.—GRADED.

Best stallion, three years old and over. owned by J. J. Reavis, $15.
Second best stallion, three years old and over, owned by John Fay, diploma.
Best stallion and family, owned by J. J. Reavis, $15.
Best mare, four years old and over, owned by Jas. Prout, $10.
Second best mare, three years old and over, owned by J. L. Keesicker, diploma.

CLASS III.—HORSES OF ALL WORK.

Best stallion, three years old and over, owned by H. Mooney, $10.
Best mare, three years old and over, owned by M. Wicks, $7 50.

CLASS IV.—DRAFT HORSES.

Best stallion, three years old, owned by J. J. Reavis, $10.
Second best stallion, three years old and over, owned by A. B. Collins, diploma.
Best mare, three years old and over, owned by M. Wicks, $7 50.

CLASS V.—ROADSTERS.

Best stallion, three years old and over, owned by J. T. McIntosh, $10.
Second best stallion, three years old and over, owned by E. C. Nichols, diploma.
Best stallion, two years old and over, owned by J. T. McIntosh, $7 50.
Second best roadster, gelding, owned by J. J. Reavis, $7 50.
Best mare, three years old and over, owned by J. T. McIntosh, $10.
Best mare, two years old and over, owned by J. J. Reavis, $7 50.

CLASS VI.—CARRIAGE HORSES.

Best double team, owned by T. H. Barnard, $10.
Second best double team, owned by B. F. Allen, diploma.
Best single horse, owned by L. H. McIntosh, $7 50.
Second best single horse, owned by J. J. Waste, diploma.

CLASS VII.—ROADSTER TEAMS.

Best, owned by C. C. Mason, $10.
Second best, owned by J. T. McIntosh, diploma.

CLASS VIII.—SADDLE HORSES.

Best, owned by Lou. McIntosh, $5.
Second best, owned by J. T. McIntosh, diploma.

CLASS IX.—COLTS.

Best yearling colt, owned by J. T. McIntosh, $7 50.
Best sucking horse colt, owned by J. J. Reavis, $5.
Second best sucking horse colt, owned by L. H. McIntosh, diploma.
Best sucking mare colt, owned by J. T. McIntosh, $5.
Second best sucking mare colt, owned by J. J. Reavis, diploma.

CLASS X.—SWEEPSTAKES.

Best stallion, owned by J. J. Reavis, $25.
Second best stallion, owned by J. T. McIntosh, diploma.
Best mare, owned by J. T. McIntosh, $20.
Second best mare, owned by J. J. Reavis, diploma.

CLASS XI.—JACKS AND MULES.

Best jack, any age, owned by J. J. Reavis, $10.
Second best jack, any age, owned by A. B. Collins, diploma.

SECOND DIVISION.

CLASS I.—DURHAM CATTLE.

Best three years old bull and over, owned by M. Wick, $15.
Best bull, two years old, owned by J. J. Reavis, $10.
Second best two years old bull, owned by M. Wicks, diploma.
Best yearling bull, owned by J. J. Reavis, $7 50.
Best bull calf, owned by M. Wicks, $5.
Second best bull calf, owned by M. Wicks, diploma.
Best cow, three years old and over, owned by M. Wicks, $15.
Second best cow, three years old and over, owned by M. Wicks, diploma.
Best cow, two years old, owned by M. Wicks, $10.
Best cow, one year old, owned by M. Wicks, $7 50.
Second best cow, one year old, owned by M. Wicks, diploma.
Best heifer calf, owned by M. Wicks, $5.
Second best heifer calf, owned by M. Wicks, diploma.
Best Durham herd, owned by M. Wicks, $20.
Best Jersey bull calf, owned by A. B. Collins, $5.

CLASS II.—GRADED CATTLE.

Best bull, owned by A. B. Collins, $10.
Best cow, owned by A. B. Collins, $10.
Second best cow, owned by T. H. Barnard, diploma.

THIRD DIVISION.

CLASS I.—SHEEP.

Second best ram, owned by J. H. Strowbridge, diploma.
Best ram, Spanish, owned by L. H. McIntosh, $7 50.
Pen of six ews, owned by J. H. Strowbridge, $5.
Three Spanish ews, owned by L. H. McIntosh, $7 50.
Six Spring lambs, owned by J. H. Strowbridge, $5.

CLASS II.

Best Angora buck, owned by M. Wicks, $10.
Second best Angora buck, owned by M. Wicks, diploma.
Best three Angora does, owned by M. Wicks, $10.
Best pen of kids, owned by M. Wicks, $5.

CLASS III.—SWINE.

Best Berkshire boar, owned by M. Wicks, $8.
Best sow, owned by A. B. Collins, $5.
Second best sow, owned by John Guill, diploma.
Best China Poland boar, owned by J. D. Keesicker, $5.
Best China sow, owned by J. D. Keesicker, $5.

CLASS IV.—PURE BRED POULTRY.

Best trio Black Cochins, owned by A. B. Collins, $2 50.
Best trio Silver Polish, owned by A. B. Collins, $2 50.
Best trio Golden Polish, owned by A. B. Collins, $2 50.
Best five varieties, owned by A. B. Collins, $10.
Best trio Games, owned by A. B. Collins, $7 50.
Best Pekin ducks, owned by A. B. Collins, $2 50.
Best White Leghorns, owned by J. H. Guill, $2 50.
Best Brown Leghorns, owned by J. H. Guill, $2 50.
Second best trio games, owned by J. H. Guill, diploma.
Best trio Plymouth Rocks, owned by J. F. Holland, $2 50.
Best trio B B Game, owned by J. F. Holland, $2 50.
Best trio Irish Game, owned by J. F. Holland, $2 50.
Best trio D W Game, owned by J. F. Holland, $2 50.
Best Game cock, owned by J. F. Holland, $2 50.
Best trio Dominiques, owned by C. C. Goree, $2 50.
Second best trio Dominiques, owned by D. M. Hooper, diploma.
Best trio Bronze turkeys, owned by J. F. Holland, $5.
Best Bronze gobbler, owned by J. F. Holland, $2 50.
Best trio Houdans, owned by J. F. Holland, diploma.
Best trio Langshans, owned by B. F. Allen, diploma.
Best trio geese, owned by Chas. Henry, $2.

SECOND DEPARTMENT—FIRST DIVISION.

CLASS I.—AGRICULTURAL IMPLEMENTS AND MACHINES.

Hubbard & Earll, best display of agricultural implements, $15.
C. L. Stilson & Co., mowing machine, diploma.
Hubbard & Earll, best fanning mill, $5.
C. L. Stilson & Co., best fanning mill, $5.
W. C. Stevens, best spring harrow, diploma.
Hubbard & Earll, best plow for general purposes, $5.
Graf & Johnson, best two-gang plow, California manufacture, $5.
F. Losse, farm gate, diploma.
E. C. Nichols, best farm gate, $5.
R. C. Padan, best spinning wheel, napkin ring.
Isaac Small, best clothes horse, napkin ring.
Hallet & Loy, best sewing machine, diploma.
J. V. Flint, sewing machine, diploma.
C. H. Taylor, grain saving attachment, diploma.
T. M. Lash, fruit gatherer, diploma.
T. M. Lash, Niagara lawn sprinkler, diploma.
T. M. Lash, well pump stone cylinder, $2 50.
Hubbard & Earll, well pump, diploma.
B. F. Allen, best incubator, diploma.
Thomas Alpaugh, best wheat cleaner, diploma.

CLASS II.—VEHICLES.

C. L. Stilson & Co., farm wagon, $7 50.
H. M. Bernard, two-horse family carriage, $10.
H. M. Bernard, one-horse family carriage, $10.
H. M. Bernard, one track sulky, diploma.
H. M. Bernard, best carriage spring, diploma.

THIRD DEPARTMENT.

CLASS I.—TEXTILE FABRICS.

J. F. Watkins & Co., display of dry goods, diploma.
J. F. Watkins & Co., display of carpets and rugs, $7 50.
Mrs. D. M. Hooper, home-made gent's shirt, $2.
Mrs. D. M. Hooper, best pair knit stockings, $1.
Mrs. R. C. Paden, best stocking yarn, $2.
Mrs. W. H. McKay, three foot mats, diploma.
Mrs. L. A. Hildreth, best foot mats, $2.
J. F. Entler, best ten yards rag carpet, $4.
Tickner, Burnham & Co., best display of dry goods, $20.
Tickner, Burnham & Co., best display of fancy goods, $20.
Joe Franey, best display of cloths, diploma.

CLASS II.—NEEDLE, SHELL, AND WAX WORK, CLOTHING, ETC.

C. E. White, best wreath of flowers, $2.
C. C. Goree, best crochet trimmings, napkin ring.
Miss Ida Parr, best fine lace work, napkin ring.
Miss Anna Parr, best five worsted tidies and sofa mats, napkin ring.
Miss B. Patrick, best eight crochet tidies, napkin ring.
Mrs. B. Patrick, best ornamental needlework mats, $2.
Mrs. W. M. Salmon, hand-sewed child's dress, diploma.
Mrs. J. Daniels, three patchwork quilts, $3.
Mrs. J. Daniels, one hand-worked quilt, $3.
Joseph Davidson, one knit buggy robe, diploma.
Miss Emma Knox, worsted work, air castle, napkin ring.
Mrs. J. S. Jackson, crochet shawl, $2.
Mrs. J. S. Jackson, white embroidered shawl, diploma.
Mrs. J. C. Glover, silk embroidery, diploma.
Mrs. J. C. Glover, embroidery crewel work, diploma.
Mrs. W. T. Tuckwell, one patchwork quilt, diploma.
Mrs. W. F. Locey, one wreath of wax flowers, diploma.
Mrs. Levi Smith, one patchwork quilt, diploma.
Miss Sadie Hoyl, seven crochet tidies, napkin ring.
Mrs. L. A. Hildreth, one patchwork quilt, diploma.

Mrs. L. A. Hildreth, lace-work stockings, diploma.
Mrs. L. A. Hildreth, fancy chair cushion and back, $2.
Mrs. John Guill, specimen of flower work, $2.
Miss Edith Beesley, canvas and worstedwork pincushion, diploma.
Mrs. D. T. Hicks, one tidy, diploma.
Mrs. J. C. Glover, specimens of braid work, $2.
Miss Lena Paden, fly brushes of peacock feathers, napkin ring.
Mrs. T. S. Bayley, silk embroidery, $2.
Miss Lena Paden, toilet set, $2.
Mrs. G. W. Dorn, display of skeleton leaves, diploma.
Mrs. George Peck, specimens of shell work, $2.
Mrs. J. T. Johnson, ottoman cover, $2.
Mrs. J. T. Johnson, variety of artificial flowers, $2.
Mrs. J. T. Johnson, fine lace work, diploma.
Mrs. J. F. Entler, one pair child's knit gloves, diploma.
Mrs. W. C. Stevens, best display of tidies, diploma.
Woods & Walker, men's and boys' clothing, $10.
Woods & Walker, custom made suit, diploma.
Woods & Walker, display of furnishing goods, diploma.
Woods & Walker, Knights Templar regalia, diploma.
Mrs. B. F. True, silk quilt, $3.
Miss Mattie Crosette, chenille work, $2.
Miss Mattie Crosette, best linen embroidery, $2 50.
Miss Nora Peck, best moss work, diploma.
Joe Franey, custom made coat and vest, diploma.
Mrs. J. McFeely, embroidery shawl, diploma.
A. C. Broyles, embroidered flannel, diploma.
Mrs. John Byers, shell work, diploma.
Mrs. John Byers, moss work, $2.
J. C. Glover, stamping and stamping material, diploma.

JUVENILE DEPARTMENT.

Miss Malinda Goree, pair knit woolen stockings, napkin ring.
Miss Malinda Goree, hair wreath, napkin ring.

FOURTH DEPARTMENT.

CLASS I.—MANUFACTURES, LEATHERS, ETC.

Hallet & Loy, best display of paper hangings and borders, $2 50.
Woods & Walker, best silk hat, $2.
Woods & Walker, best soft hat, diploma.
P. Peters & Bro., best pair dress boots, $2.
P. Peters & Bro., display of men's and boys' boots and shoes. $2 50.
P. Peters & Bro., best display of ladies' and girls' boots and shoes, $2 50.

CLASS II.—WORKED METALS.

R. A. McDonald, hand sewing machine, Weed & Co., diploma.
Charles Ball, display of silverware, diploma.
Charles Ball, display of table cutlery, diploma.
Hubbard & Earll, best display of hardware, $10.
Hubbard & Earll, best display of gas fixtures, $5.
Hubbard & Earll, best display of mechanics' tools, $5.
Hubbard & Earll, best agate ware, diploma.
Hibbard & Sommer, best display of clocks, diploma.
Hibbard & Sommer, best display of silverware, $5.
Hibbard & Sommer, best display of celluloid goods, diploma.
Hibbard & Sommer, best display of gold-headed canes, diploma.

CLASS III.—STOVES, CASTINGS, ETC.

Hubbard & Earll, best display of cooking stoves, $5.
Hubbard & Earll, best display of cooking ranges, $5.

CLASS IV.—MUSICAL INSTRUMENTS.

Blood & Flint, best display of musical instruments, $10.
Blood & Flint, best piano, $5.
Blood & Flint, best organ, $5.
R. Fay & Co., piano, diploma.

CLASS V.—FURNITURE, CALIFORNIA MANUFACTURE.

Hall & Loy, dressing bureau, $2 50.
Hall & Loy, best sofa, $2.
Hall & Loy, best extension table, $2 50.
Hall & Loy, best set parlor chairs, $2.
Hall & Loy, best set parlor furniture, $5.
Hall & Loy, best display of furniture, $5.
Hall & Loy, best wardrobe, $2.
Hall & Loy, best sick chair, $2.
Hall & Loy, display of school furniture, diploma.
Hall & Loy, best bedroom set, $2 50.
Hall & Loy, best display of undertakers' goods, diploma.
Mrs. L. A. Hildreth, best parlor chair, diploma.
Geo. H. Fuller, best display of school furniture, diploma.
Geo. H. Fuller, one folding settee, diploma.
Geo. H. Fuller, one store stool, diploma.
S. R. Mathewson, suspended wire cushion parlor billiard table, diploma.

CLASS VI.—WOODENWARE, ETC.

A. F. Blood, brooms, broom corn, and brushes, $5.

CLASS VIII.—CHEMICALS.

Mrs. N. M. Bunnell, French laundry bluing, diploma.
Mrs. A. E. McInespy, best hand-made soap, soft, $2.
Mrs. J. F. Entler, best hand-made soap, hard, $2.
G. W. Turner, bottle ink, diploma.
Tickner, Burnham & Co., best display of soaps, $5.
Royal Baking Powder Co., best yeast powder, diploma.

CLASS X.—STONEWARE, TILES, ETC.

W. L. Bradley, best display of dressed marble, $5.

CLASS XI.—MINERALS, FOSSILS, ETC.

J. M. Hill, best collection of minerals, etc., $5.
J. M. Hill, best collection of old coins, diploma.
W. Proud, best ornithological collection, $5.
A. C. Broyles, best display of coral, diploma.

FIFTH DEPARTMENT.

CLASS I.—FLOUR, GRAIN, ETC.

John Bidwell, best bushel of wheat (Tuscan), $5.
John Bidwell, best bushel Egyptian white corn, diploma.
John Bidwell, best sack of rye, diploma.
John Bidwell, best sack of flour, $3.
John Bidwell, best sack of barley, $2.
John Bidwell, best sack of oats, $2.
John Bidwell, best sack of cornmeal, $2.
John Bidwell, best sack of corn, $2.
John Bidwell, best exhibit of tobacco, $2.

CLASS II.—VEGETABLES, ROOTS, ETC.

John Bidwell, best display of Lima beans in pod, diploma.
John Bidwell, best display of other beans in pod, diploma.
John Bidwell, best twelve roots salsify, diploma.
John Bidwell, best six heads early Dutch cabbage, diploma.
John Bidwell, best half bushel sweet potatoes, $1.
John Bidwell, best six long blood beets, diploma.
John Bidwell, best twelve carrots, diploma.
John Bidwell, best peck of tomatoes, diploma.
John Bidwell, best peck pickling peppers, diploma.
John Bidwell, best six maroon squashes, diploma.
John Bidwell, best Hubbard squash, diploma.
John Bidwell, best six crook-neck squashes, diploma.
John Bidwell, second best and largest pumpkin, diploma.
John Bidwell, best one dozen sweet corn, diploma.
John Bidwell, best three watermelons, diploma.
John Bidwell, best three muskmelons, diploma.

John Bidwell, best six cucumbers, diploma.
John Bidwell, best three purple egg plants, diploma.
J. C. Moore, best six long blood beets, diploma.
J. C. Moore, best and largest pumpkin, diploma.
L. H. McIntosh, best one box Bascom's Favorite tomatoes, diploma.

CLASS III.—FLOWERS.

John Bidwell, best collection of plants, $2 50.

CLASS V.—BREAD, BUTTER, ETC.

J. H. Guill, best four pounds of butter in roll, $2.
C. E. White, best display of domestic bread, $5.
C. E. White, best display of rye bread, $1.
Mrs. S. L. Walker, best display of domestic brown bread, $1.
Mrs. S. L. Walker, best display of domestic salt rising bread, $1.
Mrs. S. L. Walker, best display of domestic corn bread, $1.
Mrs. S. L. Walker, best display of soda biscuit, $1.
Miss Annie Barham, best display of domestic wheat bread, $1.

SIXTH DEPARTMENT.

CLASS I.—GREEN FRUITS.

J. C. Moore, second best six varieties of apples, diploma.
Wm. Bonness, best six varieties of apples, $2.
Wm. Bonness, best twelve varieties of apples, $5.
Wm. Bonness, best display of apples, $5.
John Bidwell, best display of pears, $5.
John Bidwell, best twelve varieties of pears, $5.
Wm. Bonness, best three varieties of pears, diploma.
John Bidwell, best display of peaches, $5.
John Bidwell, best one variety of peaches, diploma.
Wm. Bonness, display of peaches, diploma.
J. H. Guill, display of green prunes, diploma.
John Bidwell, best display of plums, $2.
John Bidwell, best display of pomegranates, $3.
John Bidwell, best display of green figs, $2.

CLASS II.—HONEY, PRESERVES, ETC.

W. H. Fritz, one jar peach preserves, $3.
W. H. Fritz, four jars sweet pickles, diploma.
G. W. Turner, one jar pickled Siberian crabapples, diploma.
John Bidwell, best display of fruit, $2 50.
Mrs. W. M. Tupen, best display of preserves in glass, $5.
J. F. Entler, three jars of blackberry jelly, $2.
Miss Emma Henry, largest and best display of jelly, diploma.
George Parr, best display of honey, $2.

CLASS IV.—DRIED FRUITS, NUTS, ETC.

G. W. Turner, wine vinegar, $2.
Chico Box Factory, packages for shipping small fruit, diploma.
John Bidwell, one half peck English walnuts, $2.
John Bidwell, one half peck soft shelled almonds, $2.
John Bidwell, best display of raisins, $2 50.
John Bidwell, best display of grapes, $5.
John Bidwell, best twenty-five pounds dried apples, $2.
John Bidwell, best twenty-five pounds dried plums, $2.
John Bidwell, best ten pounds dried figs, $2.
A. F. Blood, soda water and syrups, diploma.
W. V. Groves, one variety of quinces, diploma.
Mrs. Allen Henry, six varieties of grapes, $2.

SEVENTH DEPARTMENT.

CLASS I.—PAINTING, DRAWING, ETC.

B. L. Compton, penmanship, $5.
T. L. Ford, best drawing, $5.
Miss Annie Rinehart, second best, diploma.

TRANSACTIONS

OF THE

SONOMA AND MARIN AGRICULTURAL ASSOCIATION,

District No. 4,

Composed of the Counties of Sonoma, Marin, Solano, Napa,
and Lake.

1880.

OFFICERS OF THE ASSOCIATION.

OFFICERS OF THE BOARD.

A. P. WHITNEY	President.
W. E. COX	Secretary.
L. ELLSWORTH	Treasurer.

DIRECTORS.

A. P. WHITNEY,
JAMES McM. SHAFTER,
A. P. OVERTON,
L. W. WALKER,
T. H. INK,
JAMES ADAMS,
WM. ZARTMAN.

REPORT.

To the Honorable the State Board of Agriculture: Pursuant to the provisions of an Act of the Legislature of the State of California, entitled "An Act to provide for the management and control of the State Agricultural Society by the State," approved April fifteenth, eighteen hundred and eighty, the Directors of the Sonoma and Marin District Agricultural Association respectfully submit this their report of the transactions of said association for the year ending this date.

W. E. COX, Secretary.

FINANCIAL STATEMENT.

Petaluma, December 1, 1880.

The Sonoma and Marin District Agricultural Association submit the following report of its receipts and expenditures for the year 1880:

Receipts.

Amount received at gate	$3,855 75
Amount received from entrances	1,317 50
Amount received from privileges and other sources	1,987 60
Amount received from State appropriation	1,500 00
Total	$8,660 85

Expenditures.

Amount paid for premiums	$4,896 50
Expenses for the year	3,213 13
Cash on hand	551 22
Total	$8,660 85

All of which is respectfully submitted.

W. E. COX, Secretary.

PREMIUMS AWARDED—1880.

FIRST DEPARTMENT.

Live Stock.	Name of Owner.	Address.	Name of Animal.	Premium.
CLASS I.—THOROUGHBRED HORSES.				
Best stallion, four years old or over	J. G. Underhill	Santa Rosa	Wheatleigh	Dip., $20 00
Best stallion, one year old and under two	J. Conway	Petaluma	Valentine	8 00
Best mare, four years old or over	G. Pacheco	Nicasio	Carrie C.	15 00
Best mare, three years old and under four	J. G. Underhill	Santa Rosa	Rosette	12 00
Best mare, two years old and under three	G. Pacheco	Nicasio	B. F. (no name)	8 00
Best suckling mare colt	G. Pacheco	Nicasio	Dairy Maid	5 00
CLASS II.—GRADED HORSES.				
Best stallion, four years old or over	John Pfaw	Petaluma	Eureka	Dip., $15 00
Best stallion, three years old and under four	Robert Seavy	Petaluma	Billy Hayes	12 00
Best stallion, two years old and under three	Wm. Bihler	Petaluma	George	8 00
Best stallion, one year old and under two	B. E. Harris	Vallejo	Grenadier	6 00
Best mare, four years old and over	Daniel Brown	Petaluma	Annie Adams	12 00
Best mare, three years old and under four	John Pfaw	Petaluma	Butter Ball	9 00
Best mare, two years old and under three	Wm. Bihler	Petaluma	Mary Gray	7 00
Best mare, one year old and under two	B. E. Harris	Vallejo	Fawn	6 00
Best suckling horse colt	John Pfaw	Petaluma	Mike	5 00
Best suckling mare colt	James Biggins	Sonoma	Fannie Parnell	5 00
Best stallion and six colts	John Pfaw	Petaluma	Eureka, and six colts	20 00
CLASS III.—HORSES OF ALL WORK.				
Best stallion, four years old or over	J. R. Rose	Lakeville	Gen. McClellan, Jr.	Dip., $15 00
Best stallion, three years old and under four	H. H. Helman	Stony Point	Twilight	12 00
Best stallion, two years old and under three	J. A. Peyton	Petaluma	Sultan, Jr.	8 00
Best stallion, one year old and under two	T. M. Chapman	Petaluma	Kalloch	6 00
Best mare, four years old and over	T. M. Chapman	Petaluma	Kate	12 00
Best mare, three years old and under four	John Pfaw	Petaluma	Lizzie May	9 00
Best mare, two years old and under three	T. Perry	Petaluma	Mary	7 00
Best mare, one year old and under two	J. R. Rose	Lakeville	Nanette	6 00
Best suckling horse colt	Robt. Crane	Santa Rosa	No name	5 00
Best suckling mare colt	Willis Faught	Mark West	No name	5 00
Best stallion and six colts	Joel Merchant	Petaluma	Young Geo. M. Patchen	20 00

CLASS IV.—DRAFT HORSES.

Best stallion, four years old and over	Petal'a Horse Breeders' Association	Petaluma	Duke de Chartres	Dip., $15 00
Best stallion, three years old and under four	W. A. Manion	Solano	Don Pedro, Jr.	12 00
Best stallion, two years old and under three	David Stewart	Petaluma	Prince Charles	8 00
Best stallion, one year old and under two	J. R. Rose	Lakeville	Charlemagne	6 00
Best mare, four years old and over	Geo. D. Green	Petaluma	Kate	12 00
Best mare, three years old and under four	Wm. D. Caufield	Bloomfield	Lillie Dale	9 00
Best mare, two years old and under three	J. B. Lewis	Petaluma	Belle	7 00
Best mare, one year old and under two	H. Meacham	Petaluma	No name	6 00
Best suckling horse colt	Geo. D. Green	Petaluma	No name	5 00
Best suckling mare colt	H. Meacham	Petaluma	No name	5 00
Best stallion and six colts	Petal'a Horse Breeders' Association	Petaluma	Duke de Chartres	20 00

CLASS V.—ROADSTERS.

Best stallion, four years old or over	Daniel Brown	Petaluma	Volunteer	Dip., $15 00
Best stallion, three years old and under four	Daniel Brown	Petaluma	Jackson Temple	12 00
Best stallion, two years old and under three	Wm. Bihler	Petaluma	Reform	8 00
Best mare, four years old and over	J. Fritsch	Petaluma	Nellie	12 00
Best mare, three years old and under four	Wm. Bihler	Petaluma	Molly Scott	7 00
Best colt, one year old and under two, sired by roadster stallion	B. E. Harris		Dividend	6 00
Best stallion and six colts	Wm. Bihler	Petaluma	Gen. Daney	20 00

CLASS VI.—CARRIAGE AND SADDLE HORSES, AND JACKS.

Best single buggy horse	C. Casceres	Bodega	Eda	$7 00
Best saddle horse	W. P. Taylor	Olema	Ned	5 00
Best Jack	W. A. Manion	Solano	John Henry	10 00

CLASS VII.—THOROUGHBRED CATTLE.—DURHAMS.

Best Durham bull, four years old or over	Page Brothers	Petaluma	El Medico	$20 00
Best Durham bull, three years old and under four	B. B. Cannon	Santa Rosa	Dan Rice	15 00
Best Durham bull, two years old and under three	J. B. Redmond		Little Pat	10 00
Best Durham bull, one year old and under two	Page Brothers	Petaluma	Carol Oxford	8 00
Best Durham bull calf	I. R. Jewell	Petaluma	Gold Note	5 00
Best Durham cow, four years old and over	I. R. Jewell	Petaluma	Maid of Petaluma	15 00
Best Durham cow, three years old and under four	Page Brothers	Petaluma	Belle Christmas	10 00
Best Durham heifer, two years old	Page Brothers	Petaluma	Belle Oxford	8 00
Best Durham heifer, one year old	Page Brothers	Petaluma	Marcia	5 00
Best Durham heifer calf	Page Brothers	Petaluma	Lady Ashburner	4 00

CLASS VII.—THOROUGHBRED CATTLE.—DEVONS.

Best Bevon bull, four years old or over	L. Hanson	Sonoma	Prince	$20 00

First Department—Continued.

Live Stock.	Name of Owner.	Address.	Name of Animal.	Premium.
Best Devon bull, three years old and under four	J. R. Rose	Lakeville	Pedro	$15 00
Best Devon bull, one year old and under two	J. R. Rose	Lakeville	Judge Blunder	8 00
Best Devon bull calf	J. R. Rose	Lakeville	Frank Quarterly	5 00
Best Devon cow, four years old and over	J. R. Rose	Lakeville	Maud 2d	15 00
Best Devon cow, three years old and under four	J. R. Rose	Lakeville	Ruby	10 00
Best Devon heifer, two years old	J. R. Rose	Lakeville	Blossom	8 00
Best Devon heifer, one year old	J. R. Rose	Lakeville	Joan	5 00
Best Devon heifer calf	J. R. Rose	Lakeville	Blossom 2d	4 00
CLASS VII.—THOROUGHBRED CATTLE—AYRSHIRES.				
Best Ayrshire bull, four years old or over	Geo. Bement	Redwood City	Melanchton Callaghan	$20 00
Best Ayrshire bull, three years old and under four	James Biggins	Sonoma	Duke	15 00
Best Ayrshire bull, one year old and under two	A. Higgins	Petaluma	Duke	8 00
Best Ayrshire bull calf	A. Higgins	Petaluma	Tom	5 00
Best Ayrshire cow, four years old or over	A. Higgins	Petaluma	Kittie Clyde	15 00
Best Ayrshire cow, three years old and under four	Geo. Bement	Redwood City	Stellita	10 00
Best Ayrshire heifer, two years old	A. Higgins	Petaluma	Dolly Varden	8 00
Best Ayrshire heifer, one year old	Geo. Bement	Redwood City	Highland Maid	5 00
Best Ayrshire heifer calf	Geo. Bement	Redwood City	Marietta	4 00
ALDERNEYS.				
Best Alderney bull, four years old or over	J. McM. Shafter	Olema	Cardoni	$20 00
Best Alderney bull, two years old and under three	J. McM. Shafter	Olema	Young Surprise	10 00
Best Alderney bull, one year old and under two	W. S. Edminster	Bloomfield	Blucher	8 00
Best Alderney bull calf	Walter Turnbull	Healdsburg	Romeo	5 00
Best Alderney cow, four years old or over	J. McM. Shafter	Olema	Olema	15 00
Best Alderney cow, three years old and under four	Walter Turnbull	Healdsburg	Daisy	10 00
Best Alderney heifer, two years old	Walter Turnbull	Healdsburg	Pansy	8 00
Best Alderney heifer calf	J. McM. Shafter	Olema	No name	4 00
HOLSTEINS.				
Best Holstein bull, four years old and over	Frank Judson	Bloomfield	Duke of Holstein	$20 00
CLASS VIII.—GRADED STOCK.				
Best bull, four year old and over	P. Lauler	Petaluma	King William	$10 00
Best bull, three years old and under four	F. Starkie	Petaluma	Dick	7 00
Best bull, one year old and under two	I. R. Jewell	Petaluma	Punk	4 00

Best bull calf	Page Bros.	Petaluma	Pasha	3 00
Best cow, four years old and over	Page Bros.	Petaluma	Lady Fragrant	8 00
Best cow, three years old and under four	Wm. Hill	Petaluma	No name	6 00
Best heifer, two years old and under three	Page Bros.	Petaluma	Mamie	5 00
Best heifer, one year old and under two	Page Bros.	Petaluma	Sprightly	4 00
Best heifer calf	Wm. Hill	Petaluma	No name	3 00
SWEEPSTAKES.				
Best thoroughbred herd of not less than six animals, and not more than one male	Geo. Bement	Redwood City	Melancthon Callaghan and family (Ayrshire)	$20 00
	Page Bros.	Petaluma	El Medico and family (Durham)	20 00
Best graded herd of not less than six animals, and not more than one male	Page Bros.	Petaluma	Pasha and family	$10 00
CLASS IX.—THOROUGHBRED SHEEP.				
Best Spanish ram	Wm. Hill	Petaluma		$10 00
Best five Spanish ewes	Page Bros.	Petaluma		10 00
Best Shropshire ram	R. B. Cannon	Santa Rosa		10 00
Best Southdown ram	R. H. Crane	Santa Rosa		10 00
Best five Southdown ewes	R. H. Crane	Santa Rosa		10 00
Best Cotswold ram	H. Meacham	Petaluma		10 00
Best five Cotswold ewes	F. Judson	Bloomfield		10 00
Best five ram lambs	Page Bros.	Petaluma		5 00
Best five Spanish merino ewe lambs	Page Bros.	Petaluma		5 00
Best five Southdown ewe lambs	Robert Crane	Santa Rosa		5 00
GRADED STOCK.				
Best ram	R. B. Cannon	Santa Rosa		$6 00
Best five ewes	Page Bros.	Petaluma		6 00
Best five ram lambs	R. B. Cannon	Santa Rosa		4 00
Best five ewe lambs	R. B. Cannon	Santa Rosa		4 00
CLASS X.—GOATS. [No entries.]				
CLASS XI.—SWINE.				
Best Berkshire boar	Fred. Merchant	Petaluma		$8 00
Best Berkshire sow	Wm. Hill	Petaluma		5 00
Best Essex boar	David Stewart	Petaluma		8 00
Best Essex sow	David Stewart	Petaluma		5 00
Best China Poland boar	R. H. Crane	Santa Rosa		8 00
Best China Poland sow	R. H. Crane	Santa Rosa		5 00
Best five pigs of any breed	George Campbell	Petaluma		5 00

First Department—Continued.

Live Stock.	Name of Owner.	Address.	Name of Animal.	Premium.
CLASS XI.—GRADED STOCK.				
Best sow	John Merritt	Petaluma		$4 00
Best five pigs under six months	A. C. Shelton	Stony Point		5 00
Finest and fattest hog	Geo. Zimmerman	Petaluma		5 00
CLASS XII.—PURE BRED POULTRY.				
Best exhibit, not less than five varieties				
Best pair Light Brahma fowls	W. D. Freeman	Two Rock		2 50
Best pair Dark Brahma fowls	Mrs. J. Purrington	Petaluma		2 50
Best pair Partridge Cochin fowls	W. D. Freeman	Two Rock		2 50
Best pair Black Cochin fowls	T. D. Morris	Sonoma		2 50
Best pair White Cochin fowls	T. D. Morris	Sonoma		2 50
Best pair Buff Cochin fowls	Mrs. Wm. Hill	Petaluma		2 50
Best pair Plymouth Rock fowls	W. D. Freeman	Two Rock		2 50
Best pair White Leghorn fowls	W. D. Freeman	Two Rock		2 50
Best pair Brown Leghorn fowls	W. D. Freeman	Two Rock		2 50
Best pair White Faced Black Spanish fowls	W. D. Freeman	Two Rock		2 50
Best pair Silver Spangled Polish fowls	T. D. Morris	Sonoma		2 50
Best pair White and White Crested Polish fowls	T. D. Morris	Sonoma		2 50
Best pair Black and White Crested Polish fowls	T. D. Morris	Sonoma		2 50
Best pair Golden Spangled Hamburg fowls	T. D. Morris	Sonoma		2 50
Best pair Silver Spangled Hamburg fowls	W. D. Freeman	Two Rock		2 50
Best pair Houdan fowls	W. D. Freeman	Two Rock		2 50
Best pair Black Breasted Game fowls	T. B. Cary	Petaluma		2 50
Best pair Brown Red Game fowls	T. B. Cary	Petaluma		2 50
Best pair Blue Game fowls	T. B. Cary	Petaluma		2 50
Best pair Malay Game fowls	T. D. Morris	Sonoma		2 50
Best pair Black Breasted Game Bantam fowls	T. D. Morris	Sonoma		2 50
Best pair Sultan fowls	T. D. Morris	Sonoma		2 50
Best pair Bronze turkeys	T. D. Morris	Sonoma		5 00
Best pair wild turkeys	T. D. Morris	Sonoma		5 00
Best pair Toulouse geese	T. D. Morris	Sonoma		3 00
Best pair Bremen geese	T. D. Morris	Sonoma		3 00
Best pair China geese	W. D. Freeman	Two Rock		3 00
Best pair Pekin ducks	E. K. Evans	Stony Point		2 50
Best pair Cayuga ducks	T. D. Morris	Sonoma		2 50
Best pair Muscovy ducks	W. D. Freeman	Two Rock		2 50
Best pair Guinea fowls	W. D. Freeman	Two Rock		2 50

SECOND DEPARTMENT.

AGRICULTURAL PRODUCTS.

EXHIBITORS.	Address.	Articles.	Award.
CLASS I.			
Robert Crane	Santa Rosa	Best exhibit grain, not less than 4 varieties, 100lbs. each	$10 00
Wm. Comstock	Petaluma	Best sack Australian wheat	5 00
W. W. Chapman	Petaluma	Best sack club wheat	5 00
Robert Crane	Santa Rosa	Best sack propo wheat	5 00
T. C. Putnam	Petaluma	Best sack Chili wheat	5 00
J. H. Tupper	Petaluma	Best sack Smith wheat	5 00
Robert Crane	Santa Rosa	Best sack wheat, any other variety	5 00
W. D. Freeman	Tomales	Best sack barley	5 00
John Kendall	Petaluma	Best sack rye	5 00
W. D. Freeman	Tomales	Best sack oats	5 00
A. Jackson	Petaluma	Best sheaf Australian wheat, 100 heads	1 00
T. C. Putnam	Petaluma	Best sheaf Smith wheat, 100 heads	1 00
T. C. Putnam	Petaluma	Best sheaf Chili wheat, 100 heads	1 00
C. D. Grover	Petaluma	Best sheaf club wheat, 100 heads	1 00
A. Jackson	Petaluma	Best sheaf propo wheat, 100 heads	1 00
Robert Crane	Santa Rosa	Best sheaf wheat, any other variety, 100 heads	1 00
H. Meacham	Petaluma	Best sheaf barley, 100 heads	1 00
John Kendall	Petaluma	Best sheaf oats, 100 heads	1 00
H. Meacham	Petaluma	Best sheaf rye, 100 heads	1 00
J. C. Risk	Petaluma	Best sack flaxseed	3 00
P. Mullally	Bloomfield	Best collection potatoes, 5 varieties	5 00
P. Mullally	Bloomfield	Best single variety potatoes	2 00
H. Meacham	Petaluma	Best exhibit onions	2 00
J. M. Houx	Petaluma	Best exhibit squashes	2 00
John Kendall	Petaluma	Best exhibit peas, 10lbs.	1 50
Mrs. J. Purrington	Petaluma	Best exhibit beans, 3 varieties, 10lbs. each	2 50
T. M. Chapman	Petaluma	Best exhibit sugar beets	1 50
T. M. Chapman	Petaluma	Best exhibit mangel wurtzel beets	1 50
R. H. Crane	Santa Rosa	Best exhibit blood beets	1 50
John Kendall	Petaluma	Best exhibit rutabagas	1 50
John Kendall	Petaluma	Best exhibit corn on stalk	2 00
I. R. Jewell	Petaluma	Best exhibit hops, 25lbs.	5 00
H. Meacham	Petaluma	Best exhibit cabbage, 5 heads	1 50
Robert Crane	Santa Rosa	Best exhibit watermelons	1 50
C. D. Gibson	Petaluma	Best exhibit muskmelons	1 50
Robert Crane	Santa Rosa	Best exhibit cantaloupe melons	1 50
H. Meacham	Petaluma	Best exhibit carrots	1 00
W. W. Chapman	Petaluma	Best exhibit celery	1 00
John Kendall	Petaluma	Best display garden vegetables, 10 varieties	5 00
CLASS II.—FRUITS, NUTS, ETC.			
C. J. Mussellman	Green Valley	Largest and best collection of fruits	$20 00
John Harmon	Petaluma	Second best collection fruits	10 00
John Harmon	Petaluma	Largest and best collection of fruits raised in one orchard	10 00
W. W. Chapman	Petaluma	Best exhibit apples	5 00
John Harmon	Petaluma	Best single variety, 6 apples	2 50
J. K. Fix	Sebastopol	Best 6 varieties apples, 5 each	3 00

SECOND DEPARTMENT—Continued.

EXHIBITORS	Address.	Articles.	Award.
L. P. Rixford	Sonoma	Best collection pears	$5 00
R. H. Crane	Santa Rosa	Best single variety, 6 pears	2 50
W. W. Chapman	Petaluma	Best 6 varieties pears, 5 each	3 00
J. K. Fix	Sebastopol	Best 6 quinces	2 50
N. Carriger	Sonoma	Best collection oranges	3 00
Morris Bros	Sonoma	Best collection lemons	3 00
R. R. Hall	Sonoma	Largest and best collection of grapes, 12 varieties	20 00
Morris Bros	Sonoma	Second best collection grapes	10 00
Morris Bros	Sonoma	Best collection grapes raised in one vineyard	10 00
Morris Bros	Sonoma	Best exhibit foreign grapes	5 00
Morris Bros	Sonoma	Best exhibit California grapes	3 00
R. R. Hall	Sonoma	Largest bunch of grapes, any variety	2 00
L. P. Rixford	Sonoma	Best collection figs, 10 lbs	2 00
L. P. Rixford	Sonoma	Best collection almonds, 10 lbs	2 00
Mrs. L. A. Burchard	Sebastopol	Best single variety, 6 peaches	2 50
J. K. Fix	Sebastopol	Best single variety, 6 plums	2 50
CLASS III.—PRESERVED FRUITS, ETC.			
W. W. Chapman	Petaluma	Best exhibit dried fruits, 5 varieties, 5lbs. each	$10 00
W. W. Chapman	Petaluma	Best exhibit dried apples, 5lbs.	2 00
W. W. Chapman	Petaluma	Best exhibit dried peaches, 5lbs.	2 00
C. P. Hatch	Petaluma	Best exhibit dried plums, 5lbs.	2 00
W. W. Chapman	Petaluma	Best exhibit dried plums seeded, 5lbs	2 00
R. R. Hall	Sonoma	Best exhibit raisins	5 00
Mrs. G. W. Case	Petaluma	Best canned fruits, 5 varieties	5 00
Miss L. P. Matthews	Petaluma	Best exhibit jellies, 5 varieties	4 00
Mrs. G. W. Case	Petaluma	Best exhibit preserves, 3 varieties	3 00
Miss Mary Dahlman	Petaluma	Best exhibit pickles, 3 varieties	2 00
Mrs. G. W. Case	Petaluma	Best exhibit catsup, 3 bottles	1 50
CLASS IV.—BUTTER, CHEESE, AND BACON.			
Geo. Campbell	Petaluma	Best box fresh butter, 40lbs	$10 00
T. M. Chapman	Petaluma	Second best box fresh butter	5 00
D. Stewart	Petaluma	Best packed butter, packed 3 months	10 00
E. R. Charles	Petaluma	Second best packed butter, packed 3 months	5 00
S. Morrison	Petaluma	Best exhibit cheese, not less than 3	10 00
J. R. Jewell	Petaluma	Second best exhibit cheese	5 00
Robert Crane	Santa Rosa	Best exhibit hams, 3 or more	5 00
John Merritt	Petaluma	Best exhibit side bacon, 3 or more	3 00
CLASS V.—WINE, CIDER, ALE, ETC.			
George F. Hooper	Sonoma	Best exhibit wines	$20 00
G. W. Edelman	Petaluma	Best exhibit champagne	4 00
Roney & Prince	Santa Rosa	Best exhibit port wine	4 00
G. W. Edelman	Petaluma	Best exhibit red wine	4 00
George F. Hooper	Sonoma	Best exhibit white wine	4 00
Roney & Prince	Santa Rosa	Best exhibit brandy	4 00
B. F. Connolly	Petaluma	Best exhibit ale	2 00
B. F. Connolly	Petaluma	Best exhibit cider	2 00
B. F. Connolly	Petaluma	Best exhibit soda	2 00
Jesse Hunt	Sebastopol	Best exhibit blackberry wine	4 00

THIRD DEPARTMENT.

DOMESTIC MANUFACTURES.

Exhibitors.	Address.	Articles.	Award.
CLASS I.			
J. L. Dias	Petaluma	Best invention made within twelve months, automatic stock feeder	$10 00
A. Johnson	Petaluma	Best exhibit furniture	10 00
A. Johnson	Petaluma	Best exhibit upholstery	7 50
W. Zartman & Co	Petaluma	Best exhibit blacksmithing	2 50
R. Looney	Petaluma	Best exhibit brooms	3 00
William Robinson	Petaluma	Best model gate	3 00
I. W. Harris & Co	Petaluma	Best exhibit tinware	5 00
M. Roth	Petaluma	Best exhibit marble work	Diploma and 5 00
T. B. Jackson	Petaluma	Best exhibit plaster work	3 00
M. Roth	Petaluma	Best specimen stone cutting	4 00
I. R. Jewell	Petaluma	Best butter box	2 00
A. Johnson	Petaluma	Best chairs	3 00
A. N. Barnes	Petaluma	Best exhibit soap	5 00
CLASS II.—CARRIAGES, BUGGIES, AND WAGONS.			
Wm. Zartman & Co	Petaluma	Best exhibit carriages, buggies, and wagons	$20 00
Wm. Zartman & Co	Petaluma	Best family carriage	10 00
Wm. Zartman & Co	Petaluma	Best open buggy	8 00
Wm. Zartman & Co	Petaluma	Best spring wagon	8 00
H. Pirum	Petaluma	Best carriage painting	8 00
Guin & Brainerd	Petaluma	Best carriage trimming	8 00
CLASS III.—SADDLERY AND HARNESS.			
Guin & Brainerd	Petaluma	Best exhibit of saddlery	$15 00
Guin & Brainerd	Petaluma	Best set of double harness	7 00
Guin & Brainerd	Petaluma	Best set of single harness	5 00
Guin & Brainerd	Petaluma	Best saddle	4 00
Geo. F. Allen	Petaluma	Best saddletrees	2 50
CLASS IV.—AGRICULTURAL IMPLEMENTS.			
W. H. White	Bloomfield	Best subsoil plow	$5 00
J. W. Harris & Co	Petaluma	Best pump	5 00
C. P. Hatch	Petaluma	Best windmill	8 00
Frank Sproule	Petaluma	Best butter worker	3 00
C. P. Hatch	Petaluma	Best model fruit dryer	10 00

FOURTH DEPARTMENT.

Names.	Address.	Articles.	Award.
CLASS I.—PAINTING, ORNAMENTAL WORK, ETC.			
Mrs. H. L. Weston	Petaluma	Best exhibit in Class I, manufactured by one person	$10 00
J. A. Harrington	Petaluma	Best collection paintings	5 00
J. Barrington	Santa Rosa	Best specimen painting, in oil, on canvas	5 00
J. A. Harrington	Petaluma	Best portrait painting, in oil	5 00
Mrs. H. L. Weston	Petaluma	Best porcelain painting	3 00

Fourth Department—Continued.

Exhibitors.	Address.	Articles.	Award.
Miltz & Overton	Santa Rosa	Best specimen painting, in water colors	$3 00
Miltz & Overton	Santa Rosa	Best collection photographs	Diploma and 5 00
Mrs. H. M. Lewis	Petaluma	Best specimen pencil drawing	2 50
Miltz & Overton	Santa Rosa	Best specimen crayon drawing	2 50
Mrs. H. L. Weston	Petaluma	Best specimen sketching from nature	3 00
Geo. M. Tighe	Petaluma	Best specimen penmanship	2 00
Mrs. W. H. Worth	Petaluma	Best specimen hair work	2 50
Miss Mary Lewis	Petaluma	Best specimen feather work	2 50
Katie L. Griffin	Tomales	Best and largest variety wax work	5 00
Katie L. Griffin	Tomales	Best wax flowers	2 00
Mrs. E. L. Brooks	Bodega	Best specimen leather work	2 00
Mrs. L. H. Patty	Petaluma	Best specimen bead work	2 00
Mrs. Rosa Sperry	Petaluma	Best specimen moss work	2 00
Mrs. Rosa Sperry	Petaluma	Best wreath, any other kind	2 00
M. Roth	Petaluma	Best cabinet minerals, petrifactions, etc.	10 00
CLASS II.—EMBROIDERY, NEEDLEWORK, SEWING, KNITTING, ETC.			
Mrs. L. H. Patty	Petaluma	Best exhibit needlework, ten varieties	10 00
Mrs. L. H. Patty	Petaluma	Best hand sewing	3 00
Mary G. Griffin	Tomales	Best worsted embroidery	3 00
L. Fallon	Tomales	Best worsted picture	3 00
Lillian Freeman	Tomales	Best combed worsted flowers	2 00
Mrs. W. F. Shattuck	Petaluma	Best tufted worsted work	2 50
Mrs. H. L. Weston	Petaluma	Best silk embroidery on silk or velvet	3 00
Mrs. A. Kelly	Petaluma	Best silk embroidery on cotton or woolen	3 00
Mrs. D. A. Foster	Forestville	Best cotton embroidery	2 00
Mary G. Griffin	Tomales	Best embroidery on lace	2 00
Mrs. J. L. Winans	Petaluma	Best gimpure lace	2 00
Mrs. H. L. Patty	Petaluma	Best transferred work	2 00
Mrs. Frank Tate	Sonoma	Best crochet work	2 00
Mrs. W. F. Shattuck	Petaluma	Best tatting	1 00
Mrs. H. L. Patty	Petaluma	Best hemstitching	2 00
Mrs. H. L. Patty	Petaluma	Best Portuguese lace	2 00
Mrs. H. L. Patty	Petaluma	Best Spanish lace	2 00
Miss Mary J. Shafter	Point Reyes	Best embroidery in crewel work	2 00
Mrs. Frank Tate	Sonoma	Best pair woolen stockings	2 00
Mrs. Laura Derby	Petaluma	Best piece knitting	2 00
Mrs. Electra Doolittle	San Rafael	Best knit quilt	2 00
Mrs. H. Lewis	Santa Rosa	Best silk quilt	2 00
Mrs. S. A. Pierce	Petaluma	Best quilting	2 00
Mrs. M. H. Lewis	Santa Rosa	Best exhibit family machine sewing	5 00
Mrs. A. Jacobs	Petaluma	Best lady's dress	3 00
Mrs. Dr. Carpenter	Petaluma	Best baby's dress	2 50
Mrs. M. H. Lewis	Petaluma	Best gent's shirt	2 00
Mrs. M. Chapman	Petaluma	Best patchwork	2 00
Mrs. H. W. Silsby	Petaluma	Best rag mat	2 00
Mrs. J. Sproule	Petaluma	Best rag carpet	4 00
Mrs. A. Kelly	Petaluma	Best exhibit millinery	7 50
Mrs. A. Kelly	Petaluma	Best bonnet	3 00
Mrs. Dr. Carpenter	Petaluma	Best washing and ironing	3 00
CLASS III.—BREAD, CAKES, ETC.			
Miss Daisy Tuttle	Petaluma	Best wheat bread	$3 00
Mrs. A. B. Derby	Petaluma	Best Boston brown bread	3 00
Mrs. A. B. Derby	Petaluma	Best corn bread	2 50
Mrs. George Case	Petaluma	Best fruit cake	3 50

FOURTH DEPARTMENT—Continued.

EXHIBITORS.	Address.	Articles.	Award.
Mrs. Cora Bowles	Petaluma	Best pound cake	$3 00
Miss W. W. Chapman	Petaluma	Best coffee cake	2 00
Mrs. Cora Bowles	Petaluma	Best sponge cake	2 50
Miss Daisy Tuttle	Petaluma	Best assortment tarts	3 00
CLASS IV.—PLANTS, BOUQUETS, ETC.			
W. A. T. Stratton	Petaluma	Best collection trees, shrubs, and flowering plants	25 00
W. A. T. Stratton	Petaluma	Best exhibit hardy evergreen trees and shrubs for gardens	5 00
W. A. T. Stratton	Petaluma	Best exhibit flowering roses in pots	2 50
W. A. T. Stratton	Petaluma	Best miniature garden, with growing specimens	5 00
W. A. T. Stratton	Petaluma	Best exhibit fuchsias, 25 specimens	2 50
W. A. T. Stratton	Petaluma	Best exhibit begonias, 20 specimens	2 50
W. A. T. Stratton	Petaluma	Best floral design	3 00
W. A. T. Stratton	Petaluma	Best exhibit cut flowers, 200 specimens	5 00
W. A. T. Stratton	Petaluma	Best exhibit cut dahlias, 100 specimens	2 50
W. A. T. Stratton	Petaluma	Best exhibit hanging baskets	2 50
Miss L. P. Matthies	Petaluma	Best pair vase bouquets, dried flowers and grapes, natural colors	2 00
W. A. T. Stratton	Petaluma	Best pair vase bouquets, dry flowers and grasses, dyed colors and natural mixed	2 00

CHILDREN'S DEPARTMENT.

FOR CHILDREN UNDER SIXTEEN YEARS OF AGE.

NAME OF EXHIBITOR.	Address.	Article Exhibited.	Award.
Hattie F. Wiswell	Petaluma	Best exhibit plain sewing	$3 00
Hattie F. Wiswell	Petaluma	Best exhibit needlework, three pieces	5 00
Effie Warner	Petaluma	Best crochet work	2 00
Hattie F. Wiswell	Petaluma	Best transferred work	2 00
Mary Hall	Petaluma	Best darning	2 00
M. J. Walker	Petaluma	Best pencil drawing	2 00
M. J. Walker	Petaluma	Best crayon drawing	2 00
Lizzie Miller	Petaluma	Best specimen penmanship	2 00
Baby Scudder	Petaluma	Best wheat bread	2 00
Hattie F. Wiswell	Petaluma	Best sponge cake	2 00
Fannie Munday	Petaluma	Best pound cake	2 00
Addie Case	Petaluma	Best fruit cake	2 00
Frank Lippitt	Petaluma	Best exhibit mechanical skill and workmanship	2 50

SWEEPSTAKES.

FREE FOR THE STATE.

Name of Exhibitor.	Address.	Article Exhibited.	Award.
T. J. Haskins	Petaluma	Best exhibit silverware	$10 00
J. W. Harris & Co	Petaluma	Best exhibit pumps, stoves, and tinware	10 00
A. Johnson	Petaluma	Best exhibit furniture	10 00
A. M. Goodenough	San Francisco	Best exhibit pianos, organs, etc.	10 00
J. D. Lodge	Petaluma	Best sewing machine for all purposes	Diploma.
J. D. Lodge	Petaluma	Best sewing machine for fancy work	Diploma.
T. J. Haskins	Petaluma	Best exhibit crockery, glassware. and cutlery	$10 00
J. E. Pollock	San Francisco	Best collection of paintings	20 00
Mrs. Wm. Worth	Petaluma	Second best collection paintings	10 00

J. McM. SHAFTER'S PREMIUMS.

Name of Exhibitor.	Address.	Article Exhibited.	Award.
Addie Case	Petaluma	Best bread and cake	Silver plate.
M. J. Walker	Petaluma	Best baked pork and beans	Silver plate.
Clara Dahlman	Petaluma	Best salad. any kind	Silver plate.
Augusta Dahlman	Petaluma	Best soup, any kind	Silver plate.

SPECIAL PREMIUMS.

AWARDED BY THE SOCIETY.

Name of Exhibitor.	Address.	Article Exhibited.	Award.
Miss Susie Sroufe	San Francisco	Oil paintings	$5 00
Charles B. Shaw	Cloverdale	Oil paintings	2 00

TRANSACTIONS

OF THE

Sixth District Agricultural Association,

COMPRISING THE COUNTIES OF

Los Angeles, San Diego, Santa Barbara, San Bernardino,
Ventura, and Inyo.

1880.

ANNUAL REPORT.

To the honorable Board of the State Agricultural Society:

GENTLEMEN: We have to report that an association of citizens interested in agricultural interests of this district purchased the Fair grounds of the late Southern Agricultural Fair Association, and placed them in the hands of the Directors of the Sixth District Agricultural Association, to be used for the purpose of holding a Fair in last October. And herewith we transmit copies of premium list offered, and entries, at the Fair; also, list of animals and articles to which premiums were awarded and paid at the last October Fair.

From these it will be seen that the Association offered premiums amounting in the aggregate to $1,688, and that there were premiums paid upon awards, amounting in the aggregate to $1,201; thus the Society offered in premiums $487 for exhibits which did not fill.

A statement of receipts and disbursements also shows that the Association received at the Fair, from various sources, the sum $2,995 45, which, with the State appropriation, made the sum of $4,195 45, and expended the sum of $4,183 71, leaving a balance in the treasury of $11 75.

So short a time intervened between the organization of the Board and the opening of the Fair, that the management could not secure the coöperation of all those whose aid was essential to full successful exhibition of all the agricultural and kindred interests, but the Fair was a good one, giving general satisfaction to visitors and to the management. So much so, in fact, that it is confidently anticipated that by October, 1881, with a liberal appropriation by the State, an exhibition will be given that will equal any District Fair in the State.

Respectfully submitted.

W. J. NEELY, Secretary.

STATEMENT

Of Receipts and Disbursements by the Sixth District Agricultural Association at the Fair, October 18 *to* 23, 1880.

RECEIPTS.		DISBURSEMENTS.	
From the State	$1,200 00	On purses	$1,410 20
From members' tickets	162 50	On premiums	1,201 00
From gate tickets	1,395 90	On hay and straw	64 55
From grand stand	210 55	On printing and advertising	140 85
From ten per cent. on purses	532 50	On labor on grounds and at Fair	408 00
From pools	285 75	On lumber	185 68
From bar and other privileges	367 00	On sundry vouchers	674 43
From donation	15 00	On discount on $1.200 from the State.	24 00
From returned on ribbon	1 25	To W. J. Neely, Secretary, on acc't.	75 00
From donation	10 00	To balance	11 74
From donation	5 00		
From donation	5 00		
From badges	5 00		
Total	$4,195 45	Total	$4,195 45

PREMIUMS AWARDED—1880.

FIRST DEPARTMENT.

Live Stock.	Name of Owner.	Address.	Name of Animal.	Premium.
CLASS I.—THOROUGHBRED HORSES.				
Best stallion, three years old and over	E. J. Baldwin	El Monte	Rutherford	$10 00
Best stallion colt, one year old and under	E. J. Baldwin	El Monte	Albert C.	3 00
Best mare, four years old and over, with colt	J. W. Adams	Downey	Peggy Ringgold	10 00
Best mare, three years old and over	E. J. Baldwin	El Monte	Molly McCarthy	5 00
Best mare colt, one year old or under	J. W. Adams	Downey	Aunt Betsy	
Best mare colt, one year old or under	E. J. Baldwin	El Monte	Anita	3 00
CLASS II.—THOROUGHBRED FAMILIES.				
Best thoroughbred dam, with not less than two of her colts—all thoroughbred	J. W. Adams	Downey	Peggy Ringgold, with Fanie D., Uncle Tom, and Aunt Betsy	Silver plate.
Best stallion, other than thoroughbred, with not less than five of his colts—open to all	W. K. Robinson	Santa Ana	Odd Fellow, with Leaping Water, Walter Ketchum, Royal Blue, Twinkle, and Twilight	Silver waiter.
Best dam, other than thoroughbred, with not less than two of her colts	W. K. Robinson	Santa Ana	Queen Esther, with Zulu Zone and Walter Ketchum	Syrup cup & saucer.
CLASS III.—GRADED HORSES.				
Best stallion, three years old and over	W. K. Robinson	Santa Ana	Odd Fellow	$8 00
Best mare, four years old and over, with colt	H. B. Thomas	Los Angeles	Flora Temple	10 00
CLASS V.—DRAFT HORSES.				
Best stallion, three years old and over	J. R. Simmons	San Bernardino	Wide Awake	8 00
Best stallion, two years old	Thomas Parsons	Los Nietos	Thunder	5 00
CLASS VI.—ROADSTERS.				
Best stallion, three years old and over	L. J. Rose	San Gabriel	Sultan	10 00
Best gelding, three years old and over	L. J. Rose	San Gabriel	Sir Guy	5 00
Best mare, three years old and over	Jos. Workman	El Monte	Puente Maid	10 00
CLASS VIII.—ROADSTER TEAMS.				
Best span, owned and used as such, by any one person	A. J. Hutchinson	Los Angeles	Peanuts and Candy—three years old	Plate.

First Department—Continued.

Live Stock.	Name of Owner.	Address.	Name of Animal.	Premium.
CLASS IX.—SADDLE HORSES.				
Best saddle horse—mare or gelding	A. J. Hutchinson	Los Angeles	Bay mare Empress	Goblet.
CLASS X.—WORKING HORSES.				
Best and fastest span of working horses	W. K. Robinson	Santa Ana	Queen and Dash	Diploma and $10 00
CLASS XI.—COLTS.				
(Free to all, except those entered as thoroughbred and graded.)				
Best yearling mare colt	W. H. Freer	Anaheim	Belle Monte	$5 00
Best sucking horse colt	W. K. Robinson	Santa Ana	Twilight	5 00
Best sucking mare colt	W. K. Robinson	Santa Ana	Twinkle	5 00
Best exhibit of not less than six colts by one person, of any age or sex	W. K. Robinson	Santa Ana	Zulu Zone, Laughing Water, Leaping Water, Walter Ketchum, Royal Blue, Twilight, and Twinkle	10 00
CLASS XII.—SWEEPSTAKES.				
(Open to all.)				
Best stallion	E. J. Baldwin	El Monte	Rutherford	Silver waiter.
Second best stallion	E. J. Baldwin	El Monte	Grinstead	Silver butter dish.
Best mare	E. J. Baldwin	El Monte	Molly McCarty	Two doz. sil. spoons.
Second best mare	J. W. Adams	Downey	Peggy Ringgold	Sil. spoon holder.

SECOND DEPARTMENT.

Live Stock.	Name of Owner.	Address.	Name of Animal.	Premium.
CLASS I.—DURHAM CATTLE.				
Best bull, three years old and over	C. Younger	San José	Red Thorndale	$10 00
Second best bull, three years old and over	Anderson Rose	Los Angeles	Ballona Chief	5 00
Best bull, one year old	C. Younger	San José	7th Red Thorndale	5 00
Second best bull, one year old	C. Younger	San José	Nevada the 2d	2 00

Best bull calf	C. Younger	San José	17th Red Thorndale	3 00
Second best bull calf	C. Younger	San José	9th Airdrie Duke	2 00
Best cow, three years old and over	C. Younger	San José	Red Dolly 2d	10 00
Second best cow, three years old and over	C. Younger	San José	2d Rose of Forest Home	5 00
Best cow, two years old	C. Younger	San José	6th Rose of Forest Home	5 00
Best cow, one year old	C. Younger	San José	6th Rosa Nell	3 00
Second best cow, one year old	C. Younger	San José	Jessie Maynard 2d	2 00
Best heifer calf	C. Younger	San José	Oxford Rose 3d	3 00
Second best heifer calf	C. Younger	San José	7th Rose of Forest Home	2 00
CLASS II.—ALDERNEY AND JERSEY CATTLE.				
Best bull, three years old and over	F. J. Barretto	Downey	Veto	$10 00
Best bull, two years old	F. J. Barretto	Downey	California Gold Dust	5 00
Best bull, one year old	F. J. Barretto	Downey	Prince of Forest Grove	5 00
Second best bull, one year old	F. J. Barretto	Downey	Kaiser	2 00
Best bull calf	F. J. Barretto	Downey	Pacific	3 00
Second best bull calf	F. J. Barretto	Downey	Comet	2 00
Best cow, three years old and over	F. J. Barretto	Downey	Lady Ethel	10 00
Second best cow, three years old and over	F. J. Barretto	Downey	Fantail	5 00
Best cow, two years old	F. J. Barretto	Downey	Mariposa	5 00
Second best cow, two years old	F. J. Barretto	Downey	Miss Myrtle	3 00
Best cow, one year old	F. J. Barretto	Downey	Ethel Linda	5 00
Second best cow, one year old	F. J. Barretto	Downey	Lizzie Barretto	3 00
Best heifer calf	F. J. Barretto	Downey	Bona Dea	3 00
Second best heifer calf	F. J. Barretto	Downey	Vista of Forest Grove	2 00
CLASS III.—HERD OF CATTLE.				
Best herd of thoroughbred cattle over two years old, to consist of one male and four females, owned by one person, and second best herd	F. J. Barretto	Downey	Veto, with Fantail, Lady Ethel, Mariposa, and Miss Myrtle.	Silver castor.
Best herd of thoroughbred cattle over two years old, to consist of one male and four females, owned by one person, and second best herd	C. Younger	San José	Red Thorndale, with 2d Rose of Forest Home, 1st Golden Gate, Red Dolly 2d, 6th Rose of Forest Home.	Silver waiter.
Best herd of thoroughbred cattle under two years old, to consist of one male and four females, owned by one person	C. Younger	San José	7th Red Thorndale, with 6th Rosa Nell, 7th Rose of Forest Home, Dolly the 7th, Oxford Rose 3d	Silver teapot.
Best herd of thoroughbred cattle under two years old, to consist of one male and four females, owned by one person	F. J. Barretto	Downey	Prince of Forest Grove, with Lizzie Barretto, Miss Myrtle, Vista of Forest Grove, and Bona Dea	No second prem.
CLASS IV.—GRADED CATTLE.				
Best cow, two years old	W. M. Williams	Los Angeles	Vista	$5 00
Best heifer calf	W. M. Williams	Los Angeles	Rose	3 00

Second Department—Continued.

Live Stock.	Name of Owner.	Address.	Name of Animal.	Premium.
CLASS V.—SWEEPSTAKES.				
Best bull, of any age or breed	C. Younger	San José	Red Thorndale	Silver tea set.
Second best bull, of any age or breed	C. Younger	San José	7th Red Thorndale	Sil. card receiver.
Best cow, of any age or breed	C. Younger	San José	Red Dolly the 2d	Silver pitcher.
Second best cow, of any age or breed	C. Younger	San José	2d Rose of Forest Home	Syrup cup.

THIRD DEPARTMENT.

SHEEP.

Live Stock.	Name of Owner.	Address.	Name of Animal.	Premium.
Best pen, not less than five ewes two years old and over	C. Garnier	Los Angeles	Five ewes, French merino	$10 00
Second best				No entry.
Best ram, and five of his lambs	C. Garnier	Los Angeles	One French merino ram—five lambs.	$5 00
GRADES.				
Best five ewe lambs	C. Garnier	Los Angeles	Five ewe lambs	3 00
SWEEPSTAKES.				
Best ram of any age or breed, and five of his lambs.	C. Garnier	Los Angeles	One French merino ram—five lambs.	10 00

FIFTH DEPARTMENT.

LIVE STOCK.	Name of Owner.	Address.	Name of Animal.	Premium.
CLASS I.—SWINE—ESSEX AND BERKSHIRE.				
Best boar, three years old and over	Wm. Niles	Los Angeles	Imported Prince Consort	$10 00
Best boar, six months old and under one year	F. J. Barretto	Downey	Queen's Own	8 00
Second best boar, six months old and under one year	S. Washburn	Pasadino	Billy	5 00
Best breeding sow	Wm. Niles	Los Angeles	Imported Queen	10 00
Second best breeding sow	Wm. Niles	Los Angeles	Imported Victoria	5 00
Best sow, six months old and under one year	Wm. Niles	Los Angeles	Beauty	8 00
Second best sow, six months old and under one year	F. J. Barretto	Downey	Nancy Lee	5 00
Best pair of pigs under ten months	Wm. Niles	Los Angeles	Royal Duke and Beauty	10 00
CLASS II.—POLAND-CHINA AND CHESTER WHITES.				
Best boar, three years old and over	J. G. Bell	Los Angeles	One Poland-China	$10 00
Second best boar, three years old and over	Wm. Williams	Los Angeles	Vinton Duke	5 00
Best boar under three years old	T. C. Starr	San Bernardino	Standard	8 00
Best breeding sow	J. G. Bell	Los Angeles	One Poland-China	8 00
Second best breeding sow	T. C. Starr	San Bernardino	Jessie	5 00
Best sow, six months old and under one year	S. Washburn	Pasadino	Sally	8 00
Second best sow, six months old and under one year	T. C. Starr	San Bernardino	Fannie	5 00
SWEEPSTAKES.				
Best boar of any age or breed	Wm. Williams	Los Angeles	Vinton Duke	$10 00
Best breeding sow of any age or breed	Wm. Niles	Los Angeles	Victoria	10 00
Best pen of six pigs of any age	Wm. Niles	Los Angeles	Six pigs	10 00
Best family, all of the same breed, one boar, two sows, and six pigs	Wm. Niles	Los Angeles		10 00

SIXTH DEPARTMENT.

Live Stock.	Name of Owner.	Address.	Premium.
CLASS I.—POULTRY.			
Best pair of Light Brahma fowls	Wm. Niles	Los Angeles	$2 00
Best pair of Plymouth Rock fowls	Wm. Niles	Los Angeles	2 00
Best pair of Dominique fowls	Wm. Niles	Los Angeles	2 00
Best pair of White Leghorn fowls	Wm. Niles	Los Angeles	2 00
Best pair of Brown Leghorn fowls	Wm. Niles	Los Angeles	2 00
Best pair of White Faced Black Spanish fowls.	Wm. Niles	Los Angeles	2 00
Best pair of Houdan fowls	Wm. Niles	Los Angeles	2 00
Best pair of Black Breasted Game fowls	Wm. Niles	Los Angeles	2 00
Best pair of Game Bantam fowls	Wm. Niles	Los Angeles	2 50
Best pair of Langshan fowls	Wm. Niles	Los Angeles	2 00
Best pair of Bronze turkeys	Alex. M. Shields	Compton	3 00
Best pair of Half Bronze turkeys	Wm. Niles	Los Angeles	3 00
Best pair of geese	Wm. Niles	Los Angeles	3 00
Best pair of Partridge Cochins	Wm. Niles	Los Angeles	2 00
Best pair of Black Cochins	T. C. Starr	San Bernardino	2 00
Best pair of White Cochins	Wm. Niles	Los Angeles	2 00
Best pair of Buff Cochins	Wm. Niles	Los Angeles	2 00
Best pair of Aylesbury ducks	Wm. Niles	Los Angeles	2 00
Best pair of Rouen ducks	Alex. M. Shields	Compton	2 00
Best pair of Pekin ducks	Wm. Niles	Los Angeles	2 00
Best exhibit of ducks, two or more varieties	Wm. Niles	Los Angeles	2 00
Best pair of Guinea fowls	Wm. Niles	Los Angeles	2 00
Best pair of peacocks	Wm. Niles	Los Angeles	5 00
Best and largest exhibit of poultry by any one person	Wm. Niles	Los Angeles	15 00

SEVENTH DEPARTMENT.

Exhibit.	Name of Owner.	Address.	Premium.
CLASSES I AND II.—AGRICULTURAL MACHINES.			
Best display	Bower & Baker	Los Angeles	$15 00
Best pulverizer	Chicago Screen pulverizing Manufacturing Co.	J. Philips Ag't, Los Angeles	Diploma
Acme pulverizing harrow cultivator	Nash & Bros.	G. B. Adams, San Gabriel	Diploma
CLASS III.—CARRIAGES AND WAGONS.			
Best display	Pacific Wagon Co.	Los Angeles	$10 00
Best one-horse family carriage	Pacific Wagon Co.	Los Angeles	Diploma
Best ladies' phæton	Pacific Wagon Co.	Los Angeles	Diploma
Best top buggy	Pacific Wagon Co.	Los Angeles	Diploma
Best open buggy	Columbus B'gy Co.	H. Hislop, Ag't Los Angeles	Diploma
Best two-seated open carriage	Columbus B'gy Co.		Diploma
Best butchers' wagon	Rees & Worsching	Los Angeles	Diploma
Best fruit wagon	Rees & Worsching	Los Angeles	Diploma
Best farm wagon	McGavin & White	Los Angeles	Diploma

EIGHTH DEPARTMENT.

Exhibit.	Name of Owner.	Address.	Premium.
CLASSES I, II, AND III.—AGRICULTURAL PRODUCTS.			
Best sample of rye	Mrs. E. Brown	Pasadina	$3 00
Best sample of oats	T. Bauberry	Pasadina	3 00
Best sample of barley	T. Bauberry	Pasadina	3 00
Best bin of yellow corn	F. A. Coffman		5 00
Best bin of white corn	F. R. Slaughter	Los Angeles	5 00
Best display of Irish potatoes	H. Goepper		5 00
Best display of sweet potatoes	Jno. Banyle		3 00
Best display of sugar beets	R. Nadean	Los Angeles	5 00
Best display of tomatoes	R. R. Bryant	Los Angeles	5 00
Best display of pumpkins	S. C. Smith	Los Angeles	10 00
Best display of castor beans	W. S. Arnold		3 00
Best display of cheese	J. J. Hinshman		Dip., 5 00
Best cheese	R. J. Valdez		5 00
Best display of butter	F. J. Barretto	Downey	7 00
Second best display of butter	Elwood Cooper	Santa Barbara	3 00
Best display of apples	W. B. Mower		5 00
Best display of pears	O. N. Cadwell		5 00
Best display of peaches	O. H. Conger	Pasadina	5 00
Best display of plums	G. D. Compton	Compton	3 00
Best display of dried fruit	Jos. A. Day		10 00
Best display of nuts	Kimball Bros.	Los Angeles	5 00
Best display of grapes	Kimball Bros.	Los Angeles	10 00

TENTH DEPARTMENT.

FIREMEN'S TOURNAMENT.	
Trial of engine; Confidence Engine Company No. 2, Los Angeles—Trumpet	$100 00
Competitive Drill:	
Confidence Engine Company No. 2, Los Angeles—First premium	60 00
Pioneer Engine Company No. 1, San Bernardino—Second premium	40 00
LADIES' RIDING.	
Most graceful rider:	
Miss Flora Wood—First premium	$20 00
Miss M. F. Chase—Second premium	10 00
BYCICLE RACING.	
Henry Finkler—Prize	$35 00

TRANSACTIONS

OF THE

Seventh District Agricultural Association

For 1880,

Composed of the Counties of Monterey, Santa Cruz, San Luis Obispo, and San Benito.

OFFICERS OF THE ASSOCIATION.

J. D. CARR	President.
S. J. WESTLAKE	Secretary.
WM. VANDERHURST	Treasurer.

DIRECTORS.

E. SHERWOOD,
H. S. BALL,
J. B. IVERSON,
Hon. THOS. FLINT,
P. W. MURPHY,
P. F. DEAK,
W. V. McGARVEY.

REPORT.

Showing the articles and list of stock exhibited at the Fair of said Association, held at Salinas City, Monterey County, California, October 12th to 16th, inclusive, 1880; the articles and stock on which premiums were awarded, the amount of receipts and expenditures, and the objects for which expenditures have been made.

EXHIBITS AT THE FAIR—1880.

LIVE STOCK.

CLASS I.—HORSES—ROADSTERS.

STALLIONS.

Four years old and upwards.

James Delaney, Salinas City—Vermont Jr., $10.

MARES.

Four years old and over.

James Delaney, Salinas City—Fair Ellen.
P. Kilburn, Salinas City—Birdie, $10.

HORSES FOR ALL PURPOSES.

STALLIONS.

Three years old and upwards.

James Delaney, Salinas City—Carr's Membrino, $15.
José de J. Garcia, San Antonio—Gray Prince.

Two years.

James Delaney, Salinas City—George Washington, $10.

One year.

James Lynn, Salinas City—Dr. Ford.
J. R. Hebbron, Natividad—Geo. C. Perkins, $7 50.
J. C. Storm, Salinas City—Jimmy.

SUCKING COLTS.

James Lynn, Salinas City—Kate.
James Lynn, Salinas City—Fanny.
Wm. Robson, Salinas City—Fulton, $5.
Wm. Robson, Salinas City—Dick.
Wm. Robson, Salinas City—Jim.
M. Lynn, Salinas City—Hancock.

MARES.

Three years old and upwards.

J. C. Drew, Watsonville—Fanny, $7 50.
J. C. Storm, Salinas City—Coolie.

Two years.

Wm. Vanderhurst, Salinas City—Mamie, $7 50.

One year old.

J. C. Drew, Watsonville—Vixen.
J. B. Iverson, Salinas City—Lizzie, $5.
Wm. Robson, Salinas City—Kate.

GELDINGS.

Three years old and upwards.

James Delaney, Salinas City—Wanderer.
William Brumwell, Salinas City—Giraffe, $15.

Two years old.

J. C. Drew, Watsonville—Nevada.
James Delaney, Salinas City—Robert E. Lee, $7 50.
James Delaney, Salinas City—General Jackson.

MARES.

Four years old and over.

James Lynn, Salinas City—Polly.
James Lynn, Salinas City—Fannie, $10.

Three years old.

James Delaney, Salinas City—Lady Elmo, $7 50.

DRAFT HORSES.

STALLIONS.

Three years old and upward.

W. B. Ford, Salinas City—Fulton, $10.
W. B. Ford, Salinas City—Revere.

Two years old.

Peter Kelly, Gonzales—Major, $5.

MARES.

Three years old and upward.

William Robson, Salinas City—Mary, second premium.
B. Cockerill, Soledad—Ida.
M. Lynn, Salinas City—Polly, $10, first premium.
M. Lynn, Salinas City—May, third premium.
J. B. Smith, Santa Rita—Bet.

Two years old.

J. B. Smith, Santa Rita—Bet, first premium, $7 50.
J. B. Smith, Santa Rita—Lucy, second premium.

CARRIAGE HORSES.

Span of Carriage Horses.

Jas. Lynn, Salinas City—George and Prince, $10.

Span of Buggy Horses.

Jas. Delaney, Salinas City—John and George, $7 50.

SWEEPSTAKES.

Stallion, with four or more of his colts.

Jas. Delaney, Salinas City—Carr's Membrinos.
W. B. Ford, Salinas City—Fullon, $10.

Mare, with four or more of her colts.

J. R. Hebbron, Natividad—Susie, $10.

Stallion of any breed or age.

Jas. Delaney, Salinas City—Vermont Jr., $10.
Jas. Delaney, Salinas City—Thos. Elmo.
Jas. Lynn, Salinas City—Dr. Ford.
W. B. Ford, Salinas City—Rivier.
J. R. Hebbron, Natividad—Geo. C. Perkins.
J. C. Storm, Salinas City—Jimmy.
Jose de J. Garcia, San Antonia—Gray Prince.

Mare, of any breed or age.

J. C. Storm, Salinas City—Coolie.
Wm. Vanderhurst, Salinas City—Mamie, $10.

Gelding, of any breed or age.

Jas. Delaney, Salinas City—Wanderer.
Jas. Delaney, Salinas City—May Day.
Jas. Lynn, Salinas City—George.
Jas. Lynn, Salinas City—Prince.
Wm. Vanderhurst, Salinas City—Charley, $10.

Colt, of any breed or age.

Wm. Robson, Salinas City—Fallon.
Wm. Robson, Salinas City—Dick, $5.
Wm. Robson, Salinas City—Jim.
Jas. Lynn, Salinas City—Kate.
Jas. Lynn, Salinas City—Fanny.

CLASS II.—DURHAM CATTLE.

BULLS.

Two years old.

J. D. Carr, Salinas City—Independence, $7 50.

One year old.

J. D. Carr, Salinas City—Oxford Beau, $7 50.

COWS.

Four years old and over.

J. D. Carr, Salinas City—Pet of Geneva, 2d premium, $5.
J. D. Carr, Salinas City—Hope 22d, 1st premium, $10.
J. D. Carr, Salinas City—Portulacca 2d.
J. D. Carr, Salinas City—3d Maid of Monterey.

Three years old.

J. D. Carr, Salinas City—Fairy Queen, $7 50.

Two years old.

J. D. Carr, Salinas City—Gabilan Beauty, 1st premium, $7 50.
J. D. Carr, Salinas City—Hope 28th, 2d premium.

One year old.

J. D. Carr, Salinas City—1st Belle of Gabilan Ranch.
J. D. Carr, Salinas City—Fairy Queen 5th, 2d premium, $3.
J. D. Carr, Salinas City—Lady Oxford 2d.
J. D. Carr, Salinas City—18th Maid of Monterey, 1st premium, $5.

CALVES.

J. D. Carr, Salinas City—23d Duke of Gabilan, $5.
J. D. Carr, Salinas City—28th Duke of Gabilan, $3.
J. D. Carr, Salinas City—19th Maid of Monterey, $5.
J. D. Carr, Salinas City—20th Maid of Monterey, $3.

DEVONS.

CALVES.

George Graves, Salinas City—Salinas Belle, $5.

GRADED CATTLE.

BULLS.

George Graves, Salinas City—Davy Crockett, $10.

COWS.

Three years old and upwards.

George Graves, Salinas City—Sallie Belle, $10.
George Graves, Salinas City—Fanny Berry.

One year old.

George Graves, Salinas City—New Constitution.
George Graves, Salinas City—Jenny Lind.
Jas. Thompson, Salinas City—Lady Mary, $3.
Jas. Thompson, Salinas City—Lady Jane.

BULL CALVES.

George Graves, Salinas City—Captain Jinks, $5.

HERD OF CATTLE.

Herd of cattle of any breed, not less than one male and five females, owned by one person.

J. D. Carr, Salinas City—Independence, Pet of Geneva 22d, Portulacca 2d, 3d Maid of Monterey, and Fairy Queen 4th, $15.

MERINO SHEEP.

Rams.

J. R. Hebbron, Natividad—Alameda, $10.

Ewes.

W. B. Ford, Salinas City—Snowflake, $7 50.
W. B. Ford, Salinas City—Daisy.

SWINE.

Boars of any breed.

R. W. Spaulding, Monterey—Colonel Sylvia, $5.
R. W. Spaulding, Monterey—Captain Jack.
R. W. Spaulding, Monterey—John Logan.

Sows of any breed.

R. W. Spaulding, Monterey—Dolly, $3.

Pair of Pigs under six months.

R. W. Spaulding, Monterey—Susie and Lawelos Chief, $3.

POULTRY.

Bates De Hart, Watsonville—One pair of Pekin ducks, $2.
Bates De Hart, Watsonville—White Leghorns, $2.
W. O. Hatch, Salinas City—Brown Leghorns, $2.
T. G. Harris, Salinas City—Sumatra game, $2.
Bates De Hart, Salinas City—Plymouth Rock, $2.

CLASS III.—MANUFACTURES.

Grain Cleaners.

A. Bull, San José—Little Chief, $5.

Plows.

A. Bull, San José—One side-draft plow.
A. Bull, San José—One steel beam plow.
A. Bull, San José—One side-hill plow.
T. G. Harris, Salinas City—One chilled plow.
T. G. Harris, Salinas City—One 12-inch turf and stubble plow, $5.
T. G. Harris, Salinas City—One 12-inch clipper plow.
T. G. Harris, Salinas City—Collins' side-hill plow.

Field Cultivators.

A. Bull, San José—Ladow field cultivator, $5.

Harrows.

San José Foundry, San José—One harrow.
George Bookeorger, Gonzales—One spring tooth harrow.
A. L. Baker—One hollow tooth harrow, $5.

Gang Plows.

A. Bull, San José—One J. I. Case sulky plow.
San José Foundry, San José—One gang plow, $5.
T. G. Harris, Salinas City—One 12-inch Brown gang plow.
T. G. Harris, Salinas City—One 14-inch Brown gang plow.

Grain Sowers.

A. Bull, San José—The Gem.
San José Foundry, San José—One seed sower, $2 50.

Mowers.

T. G. Harris, Salinas City—One Walter A. Wood's mower, $5.

Best Family Carriage.

E. Bowman, Santa Cruz—One family carriage, $7 50.

Best Open Buggy.

E. Bowman, Santa Cruz—One open buggy, $5.

Best exhibit of Guns and Pistols.

F. Gates, Salinas City—One rifle, $2 50.
F. Gates, Salinas City—One shotgun, $2 50.

Best set of Team Harness.

M. Hughes, Salinas City—Two sets of team harness, $5.

Best Buggy Harness (single.)

M. Hughes, Salinas City—One set single buggy harness, $5.

Best Buggy Harness (double.)

M. Hughes, Salinas City—One set double harness, $5.

Best Lady and Gent's Saddle.

M. Hughes, Salinas City—One lady's saddle, $3.
M. Hughes, Salinas City—One gent's saddle, $3.

Boots and Shoes.

Vanderhurst, Sanborn & Co., Salinas City—One lot boots and shoes, $5.
C. P. Nance, Salinas City—One lot boots and shoes.

California Woolen Manufactures.

Vanderhurst, Sanborn & Co., Salinas City—One lot blankets and carpets, $7 50.

Hats and Caps.

Vanderhurst, Sanborn & Co., Salinas City—One lot hats and caps, $3.
C. P. Nance, Salinas City—One lot hats and caps.

Men's Clothing.

C. P. Nance, Salinas City—One lot men's clothing, $5.

Gloves—California make.

Vanderhurst, Sanborn & Co., Salinas City—One lot gloves, $5.
C. P. Nance, Salinas City—One lot gloves.

Stockings.

Vanderhurst, Sanborn & Co., Salinas City—One lot stockings, $1.
C. P. Nance, Salinas City—One lot stockings.

Miscellaneous.

Mrs. Q. J. Haney, Salinas City—One rag carpet.
Mrs. P. B. Hunter, Salinas City—One rag carpet.
Mrs. E. St. John, Salinas City—One rag carpet, $3.
Mrs. W. W. Stone, Salinas City—One rag carpet.
Mrs. J. H. McDougall, Salinas City—One rag rug, $1.
Mrs. M. Hughes, Salinas City—One bedquilt, woolen.
Mrs. C. Gordon, Salinas City—One bedquilt, woolen.
Mrs. J. M. Smith, Salinas City—One bedquilt, woolen, $3.
Mrs. J. F. Simpson, Salinas City—One bedquilt, cotton.
Mrs. Bates De Hart, Watsonville—One bedquilt, cotton.
Mrs. C. Seighold, Salinas City—One bedquilt, cotton.
Mrs. J. F. Dixon, Salinas City—One bedquilt, cotton.
Mrs. S. M. Shearer, Salinas City—One bedquilt, cotton, $3.
Mrs. W. F. Treat, Salinas City—One bedquilt, cotton.
Mrs. Ira Tucker, Salinas City—One bedquilt, cotton.
Mrs. Sutton, Salinas City—One bedquilt, cotton.
Mrs. Bostick, Salinas City—One bedquilt, cotton.
Mrs. W. P. Nicholls, Salinas City—One bedquilt, cotton, $3.

CABINET WARE.

Parlor Furniture—California make.

Vanderhurst, Sanborn & Co., Salinas City—One set parlor furniture, $5.

Chamber Furniture—California make.

Vanderhurst, Sanborn & Co., Salinas City—One set chamber furniture, $5.

FARM PRODUCTS.

Wheat.

W. T. Gilkey, Watsonville—One sack of wheat, $2 50.
M. Williams, Salinas City—One sack of wheat.

Barley.

M. Williams, Salinas City—One sack of barley, $2 50.

Oats.

Bates DeHart, Salinas City—One sack of oats, $2 50.

Fleece.

J. R. Hebbron, Salinas City—Four bundles of fleece, $2 50.

Honey in Comb.

R. J. Adcock, San Miguel—Five pounds of honey in comb, $2 50.
J. Kliningbeard, Carmello—Five pounds of honey in comb.

Strained Honey.

R. J. Adcock, San Miguel—Article exhibited, $2 50.

GARDEN PRODUCTS.

Potatoes.

J. B. Castro, Castroville—One sack of potatoes, $1.
Bates DeHart, Watsonville—One sack of potatoes, $1.
Bates DeHart, Watsonville—One sack of potatoes (sweet), $1.
H. Corey, Salinas City—One sack of potatoes.

Dried Peas.

Bates DeHart, Watsonville—One sack of dried peas, $1.

Dried Corn.

Bates DeHart, Watsonville—One sack of dried corn, $1.

Pumpkins.

Father Sorrentinni, Salinas City—Two pumpkins, $1.
W. L. Carpenter, Salinas City—Two pumpkins, $1.

Tomatoes.

Bates DeHart, Watsonville—Twenty pounds of tomatoes, $1.

Carrots.

W. L. Carpenter, Salinas City—Three mammoth carrots, $1.

FRUITS.

Apples—not less than twenty varieties.

W. T. Gilkey, Watsonville—Twenty-seven varieties apples, $7 50.
Bates De Hart, Watsonville—Twenty-one varieties apples.

Apples—twelve varieties.

Perry Jacks, Santa Rita—Nineteen varieties apples, $5.
William Brumwell, Salinas City—Fourteen varieties apples.

Best single variety Apples.

W. F. Treat, Salinas City—Nine varieties apples, $2 50.

Pears.

W. T. Gilkey, Watsonville—Thirteen varieties, $5.
P. M. Jaeks, Salinas City—Three varieties.
William Brumwell, Salinas City—Two varieties.
W. T. Treat, Salinas City—Five varieties.

Peaches.

W. T. Gilkey, Watsonville—Two varieties, $2 50.

Plums.

W. T. Gilkey, Watsonville—Two varieties, $2.
Bates De Hart, Watsonville—One variety.

Apricots.

W. T. Gilkey, Watsonville—One variety, $1.

Quinces.

W. T. Gilkey, Watsonville—Two varieties.
William Brumwell, Salinas City—One variety.
Miss G. Kelbion, Salinas City—One variety.
W. F. Treat, Salinas City—One variety.

Nuts.

W. T. Gilley, Watsonville—One variety of English walnuts	$5.
W. T. Gilley, Watsonville—One variety of Italian chestnuts	
W. T. Gilley, Watsonville—One variety of almonds	

Domestic Canned Fruit.

Mrs. Matthews, Salinas City—Five varieties of fruit, $5.
Mrs. W. F. Treat, Salinas City—Five varieties of fruit, $1 50.
Mrs. W. F. Treat, Salinas City—Five varieties of pickles, $1 50.

Preserves.

Mrs. Matthews, Salinas City—Five varieties of preserves, $2 50.
Mrs. W. F. Treat, Salinas City—Five varieties of preserves, $1.

Jellies.

W. H. Taft, Salinas City—Four varieties.
Mrs. W. F. Treat, Salinas City—Eighteen varieties, $2 50.

BUTTER.

H. Corey, Salinas City—One box of butter, $5.

PLANTS AND FLOWERS.

W. H. Johnson, Salinas City—One lot of flowers, $2 50.
Floral Committee, Salinas City—One lot of flowers, diploma.
W. H. Johnson, Salinas City—One lot of ferns.

MILLINERY AND DRESSMAKING.

C. P. Nance, Salinas City—One lot of bonnets and hats.

EMBROIDERY, NEEDLE, AND FANCY WORK.

Miss Soto, Santa Rita—One infant's blanket, $1 50.
Mrs. Hoffman, Salinas City—One toilet set, $1 50.
Mrs. S. M. Shearer, Salinas City—Two pillow-shams, $1 50.
Mrs. F. May, Salinas City—One embroidered waste basket, $1 50.
Mrs. F. May, Salinas City—One embroidered lamberquin, $1 50.
Mrs. F. May, Salinas City—One embroidered towel, 1 50.
Mrs. F. May, Salinas City—One embroidered towel sham, $1 50.
Mrs. F. May, Salinas City—One embroidered table cover, $1 50.
Mrs. A. Dan, Salinas City—Two babies' robes, $1 50.
Mrs. James Lowe, Salinas City—One lady's skirt, $1 50.
Mrs. Smith, Salinas City—One embroidered skirt, $1 50.
Mrs. S. F. Gill, Salinas City—Nine pieces embroidery work, $2 50.

KNITTING.

Mrs. L. Brafitt, Salinas City—One piece black silk lace, $1.
Mrs. Cornett, Salinas City—One piece canvas embroidery, $1.
Mrs. Lurze, Salinas City—One knit table cover and mat, $2.
Mrs. W. C. Johnson, Salinas City—One pillow-sham—Spanish work, $1 50.
Mrs. Seyhold, Salinas City—One whisk broom-holder, $1.
Mrs. Shearer, Salinas City—One lace handkerchief, $1.
Mrs. Jackson, Salinas City—One embroidered skirt, $2 50.

BEAD WORK.

Mrs. A. Dan, Salinas City—One lamberquin and bead work, $1.
Mrs. James Lowe, Salinas City—Five pieces bead chain, $1.

CROCHET WORK.

Mrs. L. Brafitt, Salinas City—Seven pieces white crochet lace, $1.
Mrs. Joe Johnson, Salinas City—One table cloth, $1.

EMBROIDERY, NEEDLE, AND FANCY WORK.

Mrs. Jenkins, Salinas City—One worsted pincushion, $1.
Miss J. Graves, Salinas City—One pincushion.
Mrs. A. Dan, Salinas City—Two tidies, $1.
Mrs. F. May, Salinas City—One tidy.
Mrs. J. J. Simpson, Salinas City—One tidy (crochet).
Mrs. J. J. Gregory, Salinas City—One tidy.
Mrs. P. Wetzel, Salinas City—Two tidies.
Mrs. H. Hoffman, Salinas City—One tidy.
Mrs. Robinson, Salinas City—One set tidies (3).
Mrs. Robinson, Salinas City—Two tidies.
Mrs. S. M. Shearer, Salinas City—Two tidies.
Mrs. Smith, Salinas City—Two tidies.
Mrs. Gambitz, Salinas City—Two tidies.
Mrs. Webb, Salinas City—One moss harp, $1.
Mrs. Trope, Salinas City—One feather wreath, $1.
Mrs. Dixon, Salinas City—One feather duster, $1.
Mrs. J. R. Eardley, Salinas City—Worsted flowers in frame, $2.
Mrs. James Lowe, Salinas City—Three lamp mats.
Miss Emma Duncan, Salinas City—One lamp mat, $1.
Mrs. A. Dan, Salinas City—One hair wreath, $2.
Mrs. A. Robinson, Salinas City—One hair wreath.
Miss Annie Zaballa, Salinas City—One hair worked chain, $2.

NEEDLE AND FANCY WORK.

Embroidered Sofa Cushions.

Mrs. F. H. Trope, Salinas City—One embroidered sofa cushion, $2.
Mrs. A. Dan, Salinas City—One embroidered sofa cushion.

Embroidered Ladies' Collars.

Miss Louisa Gates, Salinas City—Two collars, $2.
Mrs. J. B. Smith, Salinas City—Two collars and one pair of cuffs.

Drawings.

W. Beavers, Salinas City—Two pencil drawings, $2 50.

Photography.

J. H. Eardley and W. J. Vandiveer, Salinas City—One exhibit, $5 and diploma.

Surgical Instruments.

Mrs. J. B. Smith, Salinas City—One exhibit, $5.

MISCELLANEOUS ARTICLES.

Mrs. May, Salinas City—One lot abalone shell jewelry, one embroidered waste basket, one embroidered lambrequin, one embroidered scrap bag, one embroidered towel, one embroidered towel sham.
Mrs. F. H. Trope, Salinas City—One wreath of feather flowers.
Mrs. S. L. Cutter, Salinas City—Five oil paintings (original), $5 and diploma.
Mrs. J. B. Smith, Salinas City—Four bedquilts and one embroidered sheet.
J. H. Eardley, Salinas City—Specimen of penmanship, $2 50 and diploma.
Mrs. W. P. Nicholls, Salinas City—One shell pattern bedquilt.
Mrs. Gambitz, Salinas City—Two tidies.
Miss Soto, Salinas City—One handkerchief box.
A. G. Scott, Salinas City—Russian polish.
Miss E. Howard, Salinas City—One glass painted wreath.
Mrs. F. May, Salinas City—One lot of silverware.
Mrs. W. J. Hill, Salinas City—Four centennial medals.
Mrs. C. Seighold, Salinas City—One oil painting, diploma; six pieces of bronze, and one jewelry casket.
Mrs. Dixon, Salinas City—One peacock feather duster.
E. McGuire, Salinas City—Eight specimens of horseshoes.
Hale & Co., Salinas City—Display of drygoods.
Mrs. Jackson, Salinas City—One shawl.
Henry Nolte, Salinas City—Two organs, one upright piano, and two square pianos, diploma.
Miss Ray Dietrick, Salinas City—Specimens of penmanship, diploma.

RECEIPTS AND EXPENDITURES.

Receipts.

Cash received from life membership	$100 00
Cash received from privileges	487 00
Cash received from subscriptions	396 25
Cash received from gate money, season tickets, badges, etc.	1,261 00
Cash received from entrance money	675 50
Total	$2,919 75

Expenditures.

Cash paid for hay, straw, etc.	$100 25
Cash paid for ribbons, stationery, etc.	13 35
Cash paid for labor and materials	322 10
Cash paid for premiums and purses	2,372 00
Cash paid for advertising	61 50
Cash paid for gas and water	24 50
Cash paid for National Trotting Association	25 25
Balance	80
Total	$2,919 75

All of which is respectfully submitted.

S. J. WESTLAKE, Secretary.

TRANSACTIONS

OF THE

El Dorado District Agricultural Association,

District No. 8,

Composed of the Counties of Nevada, El Dorado, Placer,
Amador, Alpine, and Mono.

1880.

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OFFICERS AND DISTRICT BOARD OF AGRICULTURE.

GEORGE G. BLANCHARD	President.
C. H. WEATHERWAX.	Secretary.
JOHN BLAIR	Treasurer.
L. G. MORRIS	Superintendent of Park and Stock Grounds.
J. H. MILLER	Superintendent of Pavilion.

BOARD OF DIRECTORS.

GEORGE G. BLANCHARD	Placerville.
H. S. MOREY	Placerville.
THOMAS HARDIE	Placerville.
THOMAS FRASER	Placerville.
JAMES H. MILLER	Latrobe.
L. G. NORRIS	Plymouth, Amador County.
CYRUS COLEMAN	Markleville, Alpine County.
J. H. NEFF	Colfax, Placer County.

REPORT.

Placerville, December 1, 1880.

To the honorable the State Board of Agriculture:

The El Dorado District Agricultural Association, No. 8, comprising the Counties of El Dorado, Placer, Amador, Nevada, Alpine, and Mono, submit the following as their report to you for the year 1880, showing all the transactions of said Association for that year.

C. H. WEATHERWAX, Secretary.

OPENING ADDRESS,

Delivered by George G. Blanchard, President.

Ladies and Gentlemen: For the tenth time we are assembled as stockholders of a great body corporate, as members and patrons of a society whose objects are to widen and deepen the channels of industry, to ennoble labor, to strengthen enterprise, and encourage self support. In opening this Fair, I could point to the exhibits before and around me as conclusive proof that since the first exhibition under the auspices of our organization the channels of industry have been both widened and deepened, labor has been ennobled, enterprise has been strengthened, and self-support encouraged. It is with no ordinary emotions of pride that I appear before you the seventh time to open your Fair, as President of the Society. Most flattering have been your bestowals of official favor upon me in this regard. I appreciate the honor, and am grateful beyond expression for it. Since our last meeting we have taken on territory, until our Society now comprises the Counties of El Dorado, Nevada, Placer, Amador, Mono, and Alpine, with El Dorado as its head center. From a private corporation we have grown to a State institution, under State control. With this increase of territory, importance, and power, we may hope to accomplish much in developing the resources of our district. The counties comprising our Society have more varied industries than any other district in the State, and have a wealth of resources found nowhere else. Nevada, Placer, El Dorado, and Amador, produce more gold than the balance of the State combined, and has since the discovery of gold at Coloma; also, Placer and El Dorado are leading as fruit growing counties. Our mountain ranges are filled with stock, with a dairy product of some two hundred and fifty tons annually; cattle, horses, sheep, and goats, find on our river banks, in our cañons, mountain valleys, and sunny slopes, grasses of extraordinary succulence. The most luxuriant vegetation abounds adjacent to our richest mines; the noise of the quartz mill mingle with the sound of the hoe and scythe; timber of rare quality and in wonderful abundance covers the surface east of the arable range; marble, iron, and copper, also abound. Where can such another combination of riches be found? Nowhere else. Each succeeding day brings the tidings of new finds of fabulous value of ancient river beds just discovered, whose bottom rock shines yellow of porphyry and seam diggings, till then never known, where gold lies in huge pockets. Of lands preëmpted, vineyards planted, and orchards set. Our farmers prosper, mine owners prosper, and the day laborer receives his two dollars and fifty cents to five dollars per day. In this, above all other districts, the transition from the labor to the capital class is made easy and most probable. Again I greet you on this our tenth anniversary, and may prosperity and happiness continue.

FINANCIAL STATEMENT.

RECEIPTS.

1880.		
July 5—	Received as receipts at Park, July 4th	$119 00
"	Commission on pools	5 00
"	Donation to track	29 00
Aug. 21—	Received as entries to race No. 1	50 00
Sept. 2—	Received as entries to race No. 4	15 00
"	Received for six membership tickets	15 00
Sept. 7—	Received as entries to race No. 2	60 00
"	Received as entries to race No. 3	30 00
"	Received as entries to race No. 5	30 00
"	Received as entries to race No. 7	60 00
Sept. 9—	Received for four membership tickets	10 00
"	Received of Thos. Stephens, donation to Park	10 00
Sept. 11—	Received for forty-four membership tickets	110 00
Sept. 13—	Received for thirty-two membership tickets	80 00
Sept. 14—	Received for one hundred and forty-three membership tickets	357 50
"	Receipts at Park, first day	40 75
"	Receipts at Pavilion, first day	13 95
"	Received for entries to race No. 1	25 00
Sept. 15—	Received for entries to race No. 4	15 00
"	Received for fifty-seven membership tickets	142 00
"	Receipts at Pavilion, second day	51 70
"	Receipts at Pavilion, second day	78 25
Sept. 16—	Received for ten membership tickets	25 00
"	Received for entries to race No. 2	15 00
"	Received for entries to race No. 3	15 00
"	Received for entries to race No. 4	15 00
"	Received for entries to race No. 5	15 00
"	Received for entries to race No. 6	60 00
"	Receipts at Pavilion, third day	64 85
"	Receipts at Park, third day	140 70
Sept. 17—	Received for entries to race No. 4	15 00
"	Received for entries to race No. 6	20 00
"	Received for entries to race No. 7	20 00
"	Received for three membership tickets	7 50
"	Receipts at Pavilion, fourth day	46 55
"	Receipts at Park, fourth day	148 70
"	Receipts of Ball Committee	85 20
"	Received for sale of fruit	5 00
"	Received for commission on pools	40 50
"	Received donations to Park	5 75
Oct. 16—	Received from State	1,200 00
Oct. 26—	Received from J. J. Ekel, for rent of Park	70 50
Sept. 25—	Received donations from Thos. Hardie	10 00
"	Received donations from W. H. Brown	25 00
"	Received donations from G. G. Blanchard	2 50
"	Received donations from J. H. Miller	2 50
Nov. 12—	Received donation from L. G. Morris	7 50
"	Received donation to Park	22 00
"	Received for two membership tickets for 1881	5 00
	Total receipts	$3,437 40

DISBURSEMENTS.

1880.		
Sept. 10—	By paid to J. Blair, for receipts, No. 1	$346 54
Sept. 14—	By paid to J. Blair, for receipts, No. 2	175 00
"	By paid to J. Blair, for receipts, No. 3	150 00
Sept. 15—	By paid to J. Blair, for receipts, No. 4	150 00
"	By paid to J. Blair, for receipts, No. 5	150 00
Sept. 16—	By paid to J. Blair, for receipts, No. 6	150 00
"	By paid to J. Blair, for receipts, No. 7	200 00
Sept. 17—	By paid to J. Blair, for receipts, No. 8	200 00
	Amount carried forward	$1,521 54

	Amount brought forward	$1,521 54
Sept. 18—	By paid to J. Blair, for receipts, No. 9	10 00
“	By paid to J. Blair, for receipts, No. 10	188 00
Sept. 25—	By paid to J. Blair, for receipts, No. 11	268 80
“	By paid to J. Blair, for receipts, No. 12	43 25
Oct. 16—	By paid to J. Blair, for receipts, No. 13	1,200 00
Oct. 26—	By paid to J. Blair, for receipts, No. 14	70 50
Nov. 12—	By paid to J. Blair, for receipts, No. 15	135 31
	Total paid	$3,437 40

There was paid upon the following orders, drawn on the Treasurer, by order of the Board of Directors:

1880.		
June 12—	Order No. 1, to H. S. Toby, for work on track	$20 00
“	Order No. 2, to W. H. Clifton, for work on the track	11 00
“	Order No. 3, to Richard Alderson, for work on the track	11 00
Sept. 9—	Order No. 4, to C. H. Weatherwax, sundries	244 04
“	Order No. 5, to S. Inch, paper	3 00
“	Order No. 6, to A. P. Hall, paper and books	11 60
“	Order No. 7, to Weatherwax & Woodward, merchandise	25 50
“	Order No. 8, to E. H. Evans, work on track	7 00
“	Order No. 9, to B. F. Post, making water cart	19 25
“	Order No. 10, to F. F. Barrs, glass	2 50
“	Order No. 11, to Mollie Reynolds, work on diplomas	38 00
“	Order No. 12, to H. Wonderly, blacksmith work	12 00
“	Order No. 13, to J. Hancock, rent of pipe	9 00
Sept. 14—	Order No. 14, to purse for race No. 1	175 00
“	Order No. 15, to purse for race No. 2	150 00
“	Order No. 16, to purse for race No. 3	150 00
“	Order No. 17, to purse for race No. 4	150 00
“	Order No. 18, to purse for race No. 5	150 00
“	Order No. 19, to purse for race No. 6	200 00
“	Order No. 20, to purse for race No. 7	200 00
“	Order No. 21, to H. S. Morey, music	188 00
Sept. 22—	Order No. 22, to C. Shatuck, doorkeeper	15 00
“	Order No. 23, to C. Cleve, mdse. lost	4 55
“	Order No. 24, to J. J. Blair, taxes	21 75
“	Order No. 25, to T. Fraser, hay	7 25
“	Order No. 26, to Weatherwax & Woodward, mdse	10 95
“	Order No. 27, to S. Inch, paper	3 50
“	Order No. 28, to H. W. Hulburt, printing	7 00
“	Order No. 29, to Mason & Reed, merchandise	3 10
“	Order No. 30, to Thos. Fraser, hay, wheat, and sundries	100 20
“	Order No. 31, to B. F. Davis, printing	42 00
“	Order No. 32, Selkirk & Smith, printing	21 50
“	Order No. 33, S. Davis, gatekeeper	12 00
“	Order No. 34, W. Wiltse, Clerk at Pavilion	12 00
“	Order No. 35, S. Ryan, laborer	9 00
“	Order No. 36, A. Brooks, laborer and watchman	22 50
“	Order No. 37, E. H. Evans, laborer	25 00
“	Order No. 38, C. H. Cromwell, Clerk	12 50
“	Order No. 39, A. Goldner, Clerk	8 00
“	Order No. 40, C. H. Weatherwax, paid driver	10 00
“	Order No. 41, W. Kranner, rent of pipe	14 00
“	Order No. 42, Thos. Miller, rent of pipe	7 85
“	Order No. 43, T. Fraser, interest on mortgage	240 00
“	Order No. 44, C. O. D., rent	80 00
“	Order No. 45, E. W. D. G. Mining Company, water	16 00
“	Order No. 46, J. J. Blair, lumber	36 45
“	Order No. 47, J. Ekel, sprinkling	45 00
“	Order No. 48, J. J. Blair, lumber	20 00
“	Order No. 49, C. H. Weatherwax, sundries	18 00
“	Order No. 50, J. J. Blair, cash paid out	21 50
“	Order No. 51, Amador Ledger, printing	7 50
Oct. 23—	Order No. 52, Mrs. R. McCumpsey, premium	3 00
“	Order No. 53, J. Askew, premiums	37 50
	Amount carried forward	$2,671 49

	Amount brought forward	$2,671 49
Oct. 23—	Order No. 54, Mrs. Hamlin, premium	2 50
"	Order No. 55, George G. Blanchard, premium	21 00
"	Order No. 56, J. J. Ekel, premium	22 50
"	Order No. 57, L. Williams, premium	17 50
"	Order No. 58, J. Kinsley, premium	17 50
"	Order No. 59, G. L. Tubbs, premium	15 00
"	Order No. 60, L. G. Norris, premium	7 50
"	Order No. 61, J. Bryan, premium	12 50
"	Order No. 62, B. C. Williams, premium	12 50
"	Order No. 63, N. S. Miller, premium	7 50
"	Order No. 64, Thomas Fraser, premium	17 00
"	Order No. 65, I. S. Bamber, premium	51 00
"	Order No. 66, L. Rosier, premium	2 50
"	Order No. 67, Thomas Clifton, premium	10 00
"	Order No. 68, Mrs. C. H. Cromwell, premium	2 50
"	Order No. 69, Miss S. Wax, premium	2 50
"	Order No. 70, Miss Rosa Ryan, premium	5 00
"	Order No. 71, Mrs. Reynolds, premium	7 50
"	Order No. 72, Miss Mollie Reynolds, premium	5 00
"	Order No. 73, Mary McCuen, premium	2 50
"	Order No. 74, Mrs. G. L. Morey, premium	1 00
"	Order No. 75, Niss N. Donahue, premium	7 50
"	Order No. 76, Mrs. Clark, premium	1 00
"	Order No. 77, Miss Lillie O'Donnell, premium	2 50
"	Order No. 78, Mrs. E. Morris, premium	1 00
"	Order No. 79, Miss Ruth King, premium	2 00
"	Order No. 80, Mrs. E. H. Evans, premium	15 00
"	Order No. 81, Miss A. Collins, premium	10 00
"	Order No. 82, Mrs. M. Mull, premium	2 50
"	Order No. 83, Mrs. Isbel, premium	1 00
"	Order No. 84, P. J. Isbel, premium	30 50
"	Order No. 85, Wax Bros., premium	5 00
"	Order No. 86, C. H. McCuen, premium	39 50
"	Order No. 87, G. H. Miller, premium	2 50
"	Order No. 88, R. Demuth, premium	5 00
"	Order No. 89, Jacob Lyon, premium	29 50
"	Order No. 90, Mrs. J. Lyon, premium	4 00
"	Order No. 91, Kramp Bros., premium	27 50
"	Order No. 92, F. Veercamp, premium	1 50
"	Order No. 93, J. C. Marsh, premium	9 50
"	Order No. 94, Mrs. J. Eddy, premium	5 50
"	Order No. 95, Mrs. J. I. Reed, premium	1 50
"	Order No. 96, W. W. Hoyt, premium	2 50
"	Order No. 97, Mrs. F. Tagtmeier, premium	3 00
"	Order No. 98, Mrs. F. Hunger, premium	4 50
"	Order No. 99, Thomas Hardie, premium	30 00
"	Order No. 100, J. G. O'Brian, premium	21 00
"	Order No. 101, J. Crippin, premium	2 50
"	Order No. 102, Thomas Wallace, premium	2 50
"	Order No. 103, Mrs. A. Darlington, premium	5 00
"	Order No. 104, R. Chalmers, premium	30 00
"	Order No. 105, Miss Aggie Blair, premium	5 00
"	Order No. 106, Jacob Lyon, premium	7 50
"	Order No. 107, Charles McCuen, premium	7 50
"	Order No. 108, I. S. Bamber, premium	5 00
"	Order No. 109, Miss Aggie Blair, premium	5 00
"	Order No. 110, Mrs C. G. Congdon, premium	5 00
"	Order No. 111, Miss N. Donahue, premium	1 50
	Total amount of orders drawn	$3,253 55

FINANCIAL CONDITION OF THE SOCIETY.

Total amount of orders drawn and not paid	$2,237 80
Amount of mortgage on Park	2,000 00
Amount of money borrowed	540 00
Total indebtedness of the El Dorado District Agricultural Association December 31, 1880	$4,777 80

PREMIUMS AWARDED.

The following are the premiums awarded at the Tenth Annual Fair of the El Dorado District Agricultural Association, No. 8, held at Placerville, September 14, 15, 16, and 17, 1880:

FIRST DEPARTMENT.

CLASS I.—THOROUGHBRED HORSES.

Best thoroughbred stallion, two years old, General Jackson, Geo. G. Blanchard, $7 50.
Best thoroughbred mare, three years old, Belle Lodi, G. G. Blanchard, $10.

CLASS II.—GRADED HORSES.

Stallions.

Best four-year old or over, Young Diamond, J. J. Ekel, $15.
Best three-year old, Dexter, J. J. Ekel, $7 50.
Best two-year old, Lew Foster, L. Williams, $7 50:
Best one-year old, Constitution, J. Kinsley, $5.
Best colt under one year old, Diamond, Jr., J. Kinsley, $2 50.

Mares.

Best four-year old or over, Mountain Maid, G. L. Tubbs, $15.
Best two-year old or over, Minnie Norris, L. G. Norris, $7 50.

HORSES OF ALL WORK.

Best four-year old or over, Random, Jr., L. Williams, $10.
Best three-year old or over, Belle, J. Bryan, $7 50.

DRAFT HORSES.

Best four-year old or over, Honest John, B. C. Williams, $10.
Best two-year old or over, Young Champion, N. S. Miller, $5.
Best one-year old or over, Fanny, N. S. Miller, $5.

ROADSTERS.

Best four-year old or over, Lodi, J. Kinsley, $10.

SWEEPSTAKES.

Best four-year old or over, Ethan Allen, J. C. Brewster, diploma.

CLASS III.—THOROUGHBRED CATTLE.—JERSEY AND ALDERNEY IN ONE CLASS.

Best bull, four-year old or over, General Grant, Jas. Asken, $15.
Best cow, two-year old or over, Jas. Asken, $7 50.
Best heifer, one year old or over, Jas. Asken, $3.
Best heifer calf, under one year old, Jas. Asken, $2.

GRADED CATTLE.

Best cow, four years old or over, T. Fraser, $7 50.

HOGS.

Best boar, under one year old, I. S. Bamber, $3.
Best breeding sow, J. Bryan, $5.
Best breeding sow, under one-year old, L. Rosier, $2 50.
Best pen of two sow pigs, J. Bryan, diploma.

POULTRY.

Best Speckled Hamburgs, T. Clifton, $2 50.
Best Plymouth Rocks, T. Clifton, $2 50.

Best Cochins, T. Fraser, $2 50.
Best Dorkins, T. Fraser, $2 50.
Best Brahmas, I. S. Bamber, $2 50.
Best Houdans, Thos. Clifton, $2 50.
Best Partridge Cochins, T. Clifton, diploma.
Best Rome ducks, Thos. Clifton, $2 50.
Best display of birds, H. Weiner, diploma.

SECOND DEPARTMENT.

CLASS II.

Best peach and plum pitter, J. Lyon, diploma.
Best apple parer, corer, and slicer, W. H. Dyer, diploma.
Best baby carriage, Thos. Wallace, diploma.
Best gopher trap, Chas. McCuen, diploma.
Best cultivator, Bachelor & Van Gelder, diploma.
Best harrow, Bachelor & Van Gelder, diploma.
Best plow, Holman, Stanton & Co., diploma.
Best barbed wire, Holman, Stanton & Co., diploma.
Best model of quartz mill, J. Beckman, diploma.

THIRD DEPARTMENT.

Best tinsmith work, Weatherwax & Woodward, diploma.
Best silver-plated ware, Weatherwax & Woodward, diploma.
Best cooking range, Weatherwax & Woodward, diploma.
Best cook stove, Weatherwax & Woodward, diploma.
Best parlor stove, Weatherwax & Woodward, diploma.
Best box stove, Weatherwax & Woodward, diploma.
Best model of clipper ships, W. F. Getchel, diploma.
Best carpenter work, Arthur W. Hale, diploma.
Best Swiss clock, Arthur W. Hale, diploma.
Best picture frames, G. W. Fratoe, diploma.
Marble work, H. G. Griffith, diploma.

FOURTH DEPARTMENT.

CLASS I.—TEXTILE FABRICS, ETC.

Best silk embroidery, Mrs. C. H. Cromwell, $2 50.
Best silk quilt, Mrs. Hamlin, $2 50.
Best patchwork, Miss S. Wax, $2 50.
Best crochet shawl, Miss Rosa Ryan, $2 50.
Best made and handsomest dress, Miss Molly Reynolds, $5.
Best home-made shirt, Miss Mary McCuen, $2 50.
Best hearth rug, Mrs. G. E. Morey, $1.
Best embroidery with beads, Miss Nona Donahue, $2 50.
Best and largest display of fancy articles, Miss Nona Donahue, $5.
Best hair work, Mrs. Clark, $1.
Best wax work, Miss Tillie O'Donnell, $1.
Best needle work picture, Miss Nona Donahue, $1 50.
Best knit stockings, Mrs. E. Morris, $1.
Best woolen stockings, Mrs. E. J. Isbel, $1.
Best gloves, Miss Ruth King, $2.
Best Angora rugs, Mrs. G. G. Blanchard, $1.
Best Angora robe, Mrs. G. G. Blanchard, $2 50.
Best rag carpet, Mrs. Robert McCumsey, Sr., $3.
Best ornamental needlework, Mrs. G. E. Morey.

CLASS II.—TEXTILE FABRICS AND MATERIALS FROM WHICH THEY ARE MADE.

Best display of ladies' clothing, Miss Rosa Ryan, $2 50.
Best display of millinery, Mrs. N. C. Mull, $2 50.
Best calico dress made by a lady over eighteen years, Mrs. S. A. Evans, $10.
Best calico dress made by a lady under eighteen years, Miss Annie Collins, $10.

FIFTH DEPARTMENT.

CLASSES I AND II.—AGRICULTURAL PRODUCTS, ETC.

Best one bushel of wheat, Wax Brothers, $2 50.
Best one bushel of rye, Wax Brothers, $2 50.
Best one bushel of barley, C. H. McCuen, $2 50.
Best exhibit of clover seed, G. H. Miller, $2 50.
Best exhibit of flour, Reuben Dumuth, $5.
Best one bushel of shelled corn, C. H. McCuen, $2 50.
Best exhibit of India corn, C. H. McCuen, $2 50.
Best exhibit of green sweet corn, Jacob Lyon, $2 50.
Best exhibit of potatoes, twenty-five pounds, C. H. McCuen, $3.
Best exhibit and greatest varieties of potatoes, one peck each, C. H. McCuen, $10.
Best new variety of potatoes, originated by the exhibitor, C. H. McCuen, $5.
Best exhibit of onions, Kramp Brothers, $2 50.
Best exhibit of tomatoes, Jacob Lyon, $1.
Best exhibit of cabbage, C. H. McCuen, $1.
Best exhibit of watermelons, Jacob Lyon, $1.
Best exhibit of muskmelons, Jacob Lyon, $1.
Best twelve parsnips, C. H. McCuen, $1.
Best twelve carrots, Jacob Lyon, $1.
Best twelve cucumbers, Jacob Lyon, $1.
Best twelve beets, Jacob Lyon, $1.
Best twelve peppers, J. C. Marsh, $1.
Best twelve turnips, Jacob Lyon, $1.
Best dried beans, twenty pounds or more, Jacob Lyon, $1.
Best quality and greatest variety of garden vegetables raised by one person, Jacob Lyon, $5.
Second best quality and greatest variety of garden vegetables raised by one person, C. H. McCuen, $2 50.
Third best quality and greatest variety of garden vegetables raised by one person, F. Veercamp, $1 50.

[Your committee would recommend that a premium of $2 be awarded to L. Rosier, for fine display of squashes; also, that a premium of $2 be awarded to C. H. McCuen, for second best quality of wheat; and to F. Veercamp, $1 50, for third best quality of wheat on exhibition.]

CLASS III.—FLOWERS, PLANTS, ETC.

Best and largest collection of flowering plants in bloom, Mrs. Eddy, $2 50.
Best collection of ornamental foliage plants, Mrs. I. Eddy, $2 50.
Best collection of new and rare plants, Mrs. O'Donnell, $1 50.
Best collection of roses in bloom, Zero, $1 50.
Best collection of fuchsias in bloom, Mrs. I. Eddy, $1 50.
Best exhibit of cut flowers, Mrs. Jacob Lyon, $1 50.
Best display of bouquets, Mrs. Bamber, $1 50.
Best collection of plants suitable for green house and window culture, Mrs. I. Eddy, $1 50.
Best display of hanging baskets, Mrs. John J. Reed, $1 50.
Best display of native grasses, C. H. McCuen, $2 50.
Best display of hemp, not less than ten pounds. Zero, $2 50.
Best display of flax, not less than ten pounds. Zero, $2 50.
Best display of cotton, not less than ten pounds, Zero, $2 50.
Best display of hops, not less than ten pounds, W. W. Hoyt, $2 50.
Best display of ramie, not less than ten pounds, Zero, $2 50.
Best display of leaf tobacco, Charles McCuen, $2 50.

And recommend the following:

Miss Ettie Barlow, dried bouquet, special mention.
Joseph O'Neil, castor beans, special mention.
Mrs. McMurry, bouquet of skeleton leaves, special premium.
The thanks of the Society to Mrs. Wickman for her elegant floral present.

CLASSES IV AND V.—AGRICULTURAL PRODUCTS, ETC.

Best twenty-five pounds firkin butter, J. Askew, $5.
Best ten pounds roll butter, J. Askew, $5.
Best ten pounds lard. Jacob Lyon, $2 50.
Best four loaves wheat bread, Mrs. Tagtmeire, $3.
Second best four loaves wheat bread, Mrs. Hunger, $2.
Best biscuit, Mrs. Hunger, $2 50.
Second best biscuit, Mrs. Fraser, $1 50.
Best corn bread, one loaf, Mrs. Fraser, $1.
Best brown bread, one loaf, Mrs. Fraser, $1.
Best rye bread, Mrs. S. L. Reynolds, $1.
Best graham bread, Mrs. S. L. Reynolds, $1.
Best salt-raising bread, Mrs. Fraser, $2.

Best exhibit and greatest variety of bread, Mrs. S. L. Reynolds, $3.
Special mention of Mrs. Veercamp's bread.

SIXTH DEPARTMENT.

CLASS I.—HORTICULTURE.

Best display of apples, J. Lyon, $5.
Second best display of apples, I. S. Bamber, $3.
Best twelve varieties of apples, I. S. Bamber, $5.
Best six varieties of apples, P. J. Isbel, $3.
Recommend premium to J. L. Weymouth, for good display of apples.
Best display of pears, I. S. Bamber, $5.
Second best display of pears, P. J. Isbel, $3.
Best twelve varieties of pears, I. S. Bamber, $5.
Best six varieties of pears, P. J. Isbel, $3.
We recommend a premium to L. D. Marks, for good display of Bartlett pears.
Best display of peaches, I. S. Bamber, $5.
Second best display of peaches, J. C. Marsh, $3.
Best six varieties of peaches, Thomas Hardie, $5.
Best varieties of peaches, I. S. Bamber, $2 50.
Best display of plums, I. S. Bamber, $5.
Second best display of plums, Jacob Lyon, $2 50.
Best five varieties of plums, J. C. Marsh, $3.
Best five varieties of plums, P. J. Isbel, $2.
Best display of nectarines, J. Lyon, $5.
Second best display of nectarines, J. C. Marsh, $2 50.
Best display of prunes, P. J. Isbel, $5.
Second best display of prunes, J. G. O'Brian, $2 50.
Best display of white figs, I. S. Bamber, $5.
Best display of other varieties of figs, J. G. O'Brian, $3.
Best display of seedling fruit, I. S. Bamber, $7.
Second best display of seedling fruit, J. G. O'Brian, $3.
Best and largest display of grapes, J. G. O'Brian, $7 50.
Second best and largest display of grapes, Thomas Hardie, $5.
Best exhibit of table grapes, T. Hardie, $5.
Best exhibit wine grapes, J. G. O'Brian, $5.
Best variety raisin grapes, Kramp Bros., $10.

CLASSES II to IV.—DRIED FRUIT, PRESERVES, ETC.

Best ten pounds dried peaches, C. McCuen, $1 50.
Best ten pounds dried apples, C. McCuen, $1 50.
Best ten pounds dried berries, C. McCuen, $1 50.
Best ten pounds dried cherries, C. McCuen, no award.
Best ten pounds dried nectarines, P. J. Isbel, $1 50.
Best ten pounds dried pears, P. J. Isbel, $1 50.
Best ten pounds sun dried figs, I. S. Bamber, $1 50.
Best ten pounds hot air dried figs, I. S. Bamber, $2 50.
Best ten pounds dried plums, J. Lyon, $1 50.
Best twenty pounds dried raisins, T. Hardie, $5.
Best display of raisins, T. Hardie, $10.
Best display of dried fruit, P. J. Isbel, $5.
Best display of dried prunes, P. J. Isbel, $1 50.

CLASS III.—NUTS.

One plate peanuts (only ones exhibited), P. J. Isbel, $2 50.
Best exhibit black walnuts, J. J. Crippin, $2 50.
Best exhibit chestnuts, Thos. Wallace, $2 50.
Best exhibit almonds, Kramp Bros., $2 50.

CLASS IV.—PRESERVES, HONEY, ETC.

Best ten pounds honey in comb, P. J. Isbel, $2 50.
Best display preserves, in glass, Mrs. Reynolds, $2 50.
Mrs. S. A. Evans, best display fruit, five varieties, hermetically sealed in glass, $5.
Mrs. A. Darlington, best exhibit jellies, $2 50.
Mrs. A. Darlington, best display of assorted pickles, $2 50.

WINES AND LIQUORS.

Robert Chalmers, best red wine, $5.
Robert Chalmers, best sweet wine, $5.

Robert Chalmers, best sherry wine, $5.
Robert Chalmers, best white wine, $5.
Robert Chalmers, best California port wine, $5.
Robert Chalmers, best display of brandies and wines, diploma and $5.
Kramp Brothers, grape brandy, $5.
Kramp Brothers, dry wine, $5.
Kramp Brothers, sparkling wine, $2 50.

Recommend special premiums to Robert Chalmers for the best Natoma wine, angelica wine, Isabella wine, Burgundy wine, green Hungarian wine, Catawba wine bitters, sweet Muscat wine, heavy wine, cherry cordial, blackberry brandy, blackberry wine, blackberry cordial.

SEVENTH DEPARTMENT.

CLASS I.—FINE ARTS.

Miss Agnes Blair, best oil painting, $5.
Miss Agnes Blair, best crayon drawing, diploma.
Miss Agnes Blair, best crayon drawing, diploma.

SPECIAL PREMIUMS.

J. Lyons, best exhibit wheat, one hundred pounds, $5.
C. McCuen, best exhibit barley, one hundred pounds, $5.
C. McCuen, best exhibit potatoes, } Tie, $5.
J. Lyons, best exhibit potatoes, }
I. S. Bamber, best exhibit fruit, $5.
Miss Aggie Blair, best exhibit in art, local artist, $5.
C. H. McCuen, most meritorious display in the pavilion, silver basket.
A. Demuth, best exhibit flour.
Mrs. S. L. Reynolds, best exhibit canned fruit; jellies, in glass, set of dishes.
Mrs. G. C. Congdon, second best exhibit canned fruit and jellies in glass, $5.
Geo. Alderson, best exhibit drygoods.
Second best exhibit of drygoods, Mierson and Jewell & Co.
Best exhibit of gents' and boys' clothing, M. Simon & Son.
Second best exhibit of gents' and boys' clothing, C. Cleve.
Best exhibit of woolen blankets, M. Simon & Son.
Best display of silverware, George Parsons.
Best exhibit of hardware, Weatherwax & Woodward.
Best exhibit of cutlery, Weatherwax & Woodward.
Best exhibit of Queensware, Weatherwax & Woodward.
Best exhibit of cabinet ware, Arthur Hale.
Best exhibit of stationery, A. P. Hall.
Best exhibit of spring-tooth harrows, Batchelor, Van Gelder & Co.
Best exhibit of plows, Oliver chilled plow, Holman, Stanton & Co.
Best exhibit of pumps, stoves, and ironware, Weatherwax & Woodward.
Best exhibit of woodenware, Arthur Hale.
Best exhibit of machinery, John Beckman, Jr.
Best exhibit of quartz, Arctic Quartz Mill, Grizzly Flat.
Best exhibit of cement gravel, S. Zerga & Co., Newtown.
Best exhibit of marble work, H. J. Griffith, Placerville.
Best exhibit of prunes, Tom Fraser, special premium.
Best exhibit of Garfield rye, T. Fraser, special premium.
Worsted work, Mrs. Hale, special mention.
Best hand-made picture frames, George Fratoe, Kelseys, diploma.
Best hand-made rug, Mrs. G. E. Morey, diploma.
Best buckskin gloves, Miss R. H. King, diploma.
Fifty canary birds, Harry Weiner, special mention.
Best fancy toilet articles, Jolly & McLure, diploma.
Best apple parer, corer, and slicer, W. H. Dyer, diploma.
Best extension stepladder, Weatherwax & Woodward, special mention.
Best plum and peach pitter, Jacob Lyon, diploma.
Best silk quilt, Mrs. Wetzler, diploma.
P. J. Isbel, hand dried fruit and peanuts, special mention.
R. Demuth, special premium for wheat, rye, Graham flour, and cornmeal, manufactured in El Dorado County.
R. A. Maddan, Placerville, cotton plant, special mention.
Mrs. J. M. Knight, silk embroidered baby skirt, also baby crochet shawl.
Mrs. S. J. Alter, Japanese vase, California soapstone vase, Swedish candlestick, special mention.
F. N. Spencer, special diploma for a most meritorious display of grapes, apples, peaches, and pears.
Ben. Parlow, special mention for fine display of cling peaches.

THE BOARD OF DIRECTORS.

SPEED PROGRAMME—1880.

TUESDAY, SEPTEMBER 14, 1880.

No. 1—Running.

Stake for two-year olds, free for all two-year olds in the district prior to July 15, 1880; entrance twenty-five dollars, and one hundred dollars added; second horse to save entrance.

Entries.

Lewis Foster, by Foster; dam, by Norfolk; entered by Lewis Williams, Mendon, El Dorado County.

Dexter, by Diamond; dam, Belmont; by J. J. Ekle, Placerville, El Dorado County.

Minnie Norris, by Leinster; dam, Lady Tyler; by Norris Bros., Plymouth, Amador County.

General Lee, by Bellanto; dam, Spotty; by M. V. Rowlings, Ione City, Amador County.

Result.

Minnie Norris	1
Dexter	2
Lewis Foster	3

Time—1; 1½.

No. 2—Running.

Purse—One hundred and fifty dollars. Half mile and repeat; first horse, one hundred dollars; second horse, fifty dollars.

Entries.

Rondo, by Norfolk; dam, Lady Tyler; by Norris Bros., Plymouth, Amador County.

Dick Taylor, sire; dam, unknown; by S. Tubbs, Buena Vista, Amador County.

Lodi, by Morge; dam, unknown; by J. J. Ekle, Placerville, El Dorado County.

Cordwood Johnny, by Lumax; dam, unknown; by B. C. Williams, Plymouth, Amador County.

Billy, sire; dam, unknown; by A. Smith, Placerville, El Dorado County.

Result.

Rondo	1	1
Lodi	2	3
Johnny	3	2
Taylor	4	4

WEDNESDAY, SEPTEMBER 15, 1880.

No. 3—Running.

Purse—One hundred and fifty dollars. One mile dash; first horse, one hundred dollars; second horse, fifty dollars.

Entries.

Lottie, by Billy Monroe; dam, unknown; by J. Wentz, Plymouth, Amador County.

Billy, by Norfolk; dam, Sallie Franklin; by J. J. Ekle, Placerville, El Dorado County.

Rondo, by Norfolk; dam, Lady Tyler.

Result.

Rondo	1
Billy	2
Lottie	3

Time—1:50.

No. 4—Trotting.

Purse—One hundred and fifty dollars. Free for all horses in the district that never beat three minutes. Mile heats, best three in five. First horse, one hundred dollars; second, fifty dollars.

Entries.

Siskiyou Girl, by Gladiator; dam, unknown; by C. E. Coward, Sacramento.
Dot, sire and dam, unknown; by F. S. Childs, Smith's Flat, El Dorado County.
Young Diamond, by Lexington; dam, Filicia; by J. J. Ekle, Placerville, El Dorado County.
Oak Leaf, by General McClellan; dam, Maggie Yarnold; by M. Cassidy, Lincoln, Placer County.
Jennie; sire and dam, unknown; by H. C. Ewing, Newcastle, Placer County.

Result.

Oak Leaf	1	1	dis.		
Siskiyou Girl	2	2	1	1	1
Dot	3	2	2	dis.	

Time—2:55.

THURSDAY, SEPTEMBER 16, 1880.

No. 5—Running.

Purse—One hundred and fifty dollars. Half mile and repeat, for two-year olds. First horse, one hundred dollars; second horse, fifty dollars.

Entries.

Lewis Foster, by Foster; dam, by Norfolk; by Lewis Williams, Mendon, El Dorado County.
General Jackson, by Monday; dam, Ned Whipple. By J. J. Ekle, Placerville, El Dorado County.
Minnie Norris, by Leinster; dam, Lady Tyler; by Norris Bros., Plymouth, Amador county.

Result.

Minnie Norris	1	1
General Jackson	2	2
Foster	3	3

Time—0:59.

No. 6—Trotting.

Purse—Two hundred dollars. Mile heats, best three in five. First horse, one hundred and fifty dollars; second horse, fifty dollars.

Entries.

Oak Leaf, by General McClellan; dam, Maggie Yarnold; by M. Cassidy, Lincoln, Placer County.
Young Diamond, by Lexington; dam, Filicia; by J. J. Ekle, Placerville, El Dorado County.
Siskiyou Girl, by Gladiator; dam, unknown; by C. E. Coward, Sacramento.
Dot, sire and dam, unknown; by F. S. Childs, Smith's Flat, El Dorado County.

Result.

Oak Leaf	1	1	2
Siskiyou Girl	2	2	1
Dot	3	dis.	

FRIDAY, SEPTEMBER 17, 1880.

No. 7—Running.

Purse—Two hundred dollars. One half mile heats, best three in five; first horse, one hundred and fifty dollars; second horse, fifty dollars.

Entries.

Billy, by Norfolk; dam, Sallie Franklin; by J. J. Ekle, Placerville, El Dorado County.
Cordwood Johnny, by Lumax; dam, unknown; by B. C. Williams, Plymouth, Amador County.
Dick Taylor, by Sir; dam, unknown; by S. Tubbs, Buena Vista, Amador County.
Rondo, by Norfolk; dam, Lady Tyler; by Norris Brothers, Plymouth, Amador County.

Result.

Cordwood Johnny	1	3	dis.	
Billy	2	2	2	2
Rondo	3	1	1	1
Dick Taylor	dis.			

Time—0:52.

The undersigned, President and Secretary of the El Dorado District Agricultural Association No. 8, hereby certify that the foregoing is a correct list of articles exhibited for premiums at the Tenth Annual Fair of said association, held at Placerville, El Dorado County, on the fourteenth, fifteenth, sixteenth, and seventeenth days of September, eighteen hundred and eighty; also, a correct report of the financial condition of the society for said year, and a correct list of the premiums awarded at said Fair. It will be seen, by a comparison of the foregoing list with the list of years before, that there is a marked improvement in resources of the county, as well as an increased activity among our farming and mining community, in the exhibition of their products. The new products, as well as new industries, will be fully shown by a comparison of the foregoing list with the list reported by the Secretary for last year.

GEO. G. BLANCHARD, President.

C. H. WEATHERWAX, Secretary.

TRANSACTIONS

OF THE

Ninth District Agricultural Association,

(Fair held at Rohnerville, Humboldt County, October 5th, 6th, 7th, and 8th, 1880),

Comprising the Counties of Del Norte, Humboldt, and Mendocino.

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OFFICERS OF THE ASSOCIATION.

JONATHAN CLARK, Eureka	President.
S. H. CRABTREE, Rohnerville	Secretary.
M. LEVINGER, Rohnerville	Treasurer.

DIRECTORS.

H. S. CASE	Hydesville.
DR. T. D. FELT	Rohnerville.
G. F. GUSHAW	Slide P. O.
F. Z. BOYNTON	Ferndale.

REPORT.

ROHNERVILLE, December 1, 1880.

To the State Board of Agriculture:

The Ninth District Agricultural Association submit the following report for 1880.

EXHIBITS AT THE FAIR—1880.

FIRST DEPARTMENT—LIVE STOCK.

CLASS I.—HORSES.

Stallions.

W. H. E. Smith, Rohnerville—Santa Claus.
W. J. Lindley, Rohnerville—Morgan.
W. M. Bohall, Arcata, Humboldt County—Fred.

Roadsters.

J. W. Slater, Blockbury—Joe Daniels.
Joseph Russ, Ferndale, Humboldt County—Overland.
C. W. Long, Eureka, Humboldt County—Hambletonian.
C. Lewis, Ferndale, Humboldt County—Robert Bonner.

Mares and Colts.

Dr. T. D. Felt, Rohnerville—Queen and colt.
L. Hurlburt, Ferndale—Mare and colt.
M. Perrott, Rohnerville—Fair and colt.
J. R. Bugbee, Ferndale—Kitty and colt.

Colts under One Year.

L. Hurlburt, Ferndale—Blanche.
B. Robinson, Rohnerville—Katie Cloud.
Geo. Jordan, Rohnerville—Juno.
J. R. Bugbee, Ferndale—Overland.

Family of Four Colts of same Sire.

Geo. Jordan, Rohnerville—Lizzie.
H. S. Case, Hydesville—Pinafore.
M. Perrott, Rohnerville—Fair.
B. Robinson, Rohnerville—Katie Cloud.

CLASS II.—CATTLE.

Bulls three years old and over.

A. Bulme, Eureka—Ben.
A. Bulme, Eureka—Volunteer.

Three years old and under.

J. K. Shannahan, Eureka—Golden.
A. Buhme, Eureka—No name.
Jos. Russ, Ferndale—Roderick.

Milch Cows, three years old and over.

J. K. Shannahan, Eureka—Fannie.
Ira Doty, Rohnerville—Pet.
Horace Drake, Rohnerville—Spot.

Heifers, two years old and under.

Jos. Russ, Ferndale—Queen.
Jos. Russ, Ferndale—Rosette 12th.
Jos. Russ, Ferndale—Rose.
Mrs. Casterlin, Hydesville—Sprightly.
J. K. Shannahan, Eureka—Betsey and Willie—twins.

CLASS III.—SHEEP.

Rams.

S. H. Leach, Rohnerville—Cotswold ram, Sam.
J. B. Jordan, Rohnerville—Merino ram, Dick.
J. B. Jordan, Rohnerville—Merino ram, Jam.
S. H. Leach, Rohnerville—Merino ram, Jim.
S. H. Leach, Rohnerville—Merino ram, Jack.

CLASS IV.—SWINE.

Boars.

L. F. Briggs, Rohnerville—Essex, Sam.
L. C. Beckwith, Hydesville—Cromwell.

Brood Sow and Pigs.

L. F. Briggs, Rohnerville—Mary Jane, and pigs.
L. C. Beckwith, Hydesville—Queen, and pigs.

CLASS V.—POULTRY.

Peter Hauck, Rohnerville—One pair chickens, cock and hen.
R. Bryant, Rohnerville—One pair chickens.
Peter Hauck, Rohnerville—One pair geese.

SECOND DEPARTMENT.

CLASS I.—MECHANICAL.

James Thompson, Rohnerville—Display of brick manufactured in the district.
P. Perry, Rohnerville—One farm wagon.
Rowe & Holmes, Eureka—One open buggy.
A. D. Smith, Rohnerville—Shod horse for light work.
A. D. Smith, Rohnerville—Shod horse for heavy work.
A. P. Compton, Rohnerville—One patent gate.
P. W. Johnson, Rohnerville—Display of leather.
S. H. Crabtree, Rohnerville—One spring bed.
Mrs. L. J. Robinson, Rhonerville—One pair buckskin gloves.
Miss Lizzie Evarts, Petrolea—One pair buckskin gloves.

THIRD DEPARTMENT.

CLASS I.—AGRICULTURAL PRODUCTS.

Rohnerville Flouring Mills—One barrel flour.
Rohnerville Flouring Mills—One half-barrel shorts.
Rohnerville Flouring Mills—Five pounds graham flour.
Miss L. Howe, Eureka—Five pounds butter.
Mrs. A. Hibbert, Rohnerville—Five pounds butter.
Mrs. Geo. Reynolds, Hydesville—Five pounds butter.
L. F. Briggs, Rohnerville—Five pounds butter.
E. Zeigler, Rhonerville—Five pounds butter.
A. Gill, Ferndale—Five pounds butter.
A. Gill, Ferndale—Fifty pounds butter three months old.
E. Zeigler, Rohnerville—One cheese.
Mrs. Wm. Taylor, Rohnerville—One cheese.

Horace Drake, Rohnerville—One bushel wheat.
Boyd Oliver, Rohnerville—One bushel wheat.
M. Perrott, Rohnerville—One bushel wheat.
John Blanton, Rohnerville—One bushel oats.
J. R. Stevens, Rohnerville—One bushel oats.
Horace Drake, Rohnerville—One bushel oats.
M. Perrott, Rohnerville—One bushel oats.
M. P. Hanson, Rohnerville—One bushel oats.
B. Oliver, Rohnerville—One bushel barley.
G. A. Byard, Rohnerville—One bushel barley.
L. F. Briggs, Rohnerville—One bushel peas.
B. Robinson, Rohnerville—Five bushels peas, five varieties.
E. Zeigler, Rohnerville—One bushel of peas.
John Wright, Rohnerville—One bushel of peas.
M. P. Hansen, Rohnerville—One bushel of peas.
Horace Drake, Rohnerville—Two sheaves of wheat.
Ed. Hichling, Rohnerville—Two sheaves of wheat.
M. P. Hanson, Rohnerville—Two sheaves of wheat.
J. R. Stevens, Rohnerville—Two sheaves of wheat.
J. T. Manon, Rohnerville—Two sheaves of wheat.
George M. Howard, Rohnerville—Twelve stalks of corn.
D. Snider, Rohnerville—Twelve stalks of corn.
Mrs. A. Hiffert, Rohnerville—Two loaves of wheat home-made bread.
Mrs. A. M. Gill, Rohnerville—Two loaves of wheat home-made bread.
Mrs. J. H. Kimball, Rohnerville—Two loaves of wheat home-made bread.
Emma Simonds, Rohnerville—Two loaves of wheat home-made bread.
Mrs. Gushaw, Slide—Two loaves of rye bread.
Jessie Martin, Rohnerville—Two loaves of bread made by Miss under fourteen years of age.
Mary Patmore, Rohnerville—Two loaves of bread made by Miss under fourteen years of age.
Alice Hauck, Rohnerville—Two loaves of bread made by Miss under fourteen years of age.
Mrs. A. M. Gill, Rohnerville—One pan of biscuit.
Emma Simonds, Rohnerville—One pan of biscuit.
Jessie Martin, Rohnerville—One pan of biscuit, by Miss under fourteen years of age.
Mary Patmore, Rohnerville—One pan of biscuit, by Miss under fourteen years of age.
Job Tower, Eureka—One dozen beets.
Daniel Snider, Slide—One dozen beets.
E. Zeigler, Rohnerville—One dozen beets.
M. P. Hanson, Rohnerville—One dozen beets.
H. A. Myrick, Rohnerville—One dozen beets.
D. Snider, Slide—One dozen turnips.
P. Hauck, Rohnerville—One dozen carrots.
Job Tower, Eureka—One dozen carrots.
P. Hauck, Rohnerville—Three heads of cabbage.
Job Tower, Eureka—Three heads of cabbage and three squashes.
P. Hauck, Rohnerville—Three squashes.
G. M. Howard, Camp Grant—One bushel of potatoes.
Dr. J. L. Eby, Rohnerville—One bushel of potatoes.
B. Oliver, Rohnerville—One bushel of potatoes.
R. Bryant, Rohnerville—One bushel of potatoes.
G. A. Byard, Rohnerville—One bushel of potatoes.
P. Hauck, Rohnerville—One bushel of potatoes.
H. McWhinney, Ferndale—One bushel of potatoes.
Job Tower, Eureka—One bushel of potatoes.
Job Tower, Eureka—Display of potatoes.
H. Drake, Rohnerville—Display of potatoes.
G. M. Howard, Camp Grant—Display of sweet potatoes.
G. M. Howard, Camp Grant—Display of onions.
H. McWhinney, Ferndale—Display of onions.
Job Tower, Eureka—Display of onions.
Job Tower, Eureka—Display of parsnips.
G. M. Howard, Camp Grant—Display of corn in ear.
G. M. Howard, Camp Grant—Display of watermelons.
W. B. Dobyn, Camp Grant—Display of corn in ear.
Grant Myers, Camp Grant—Grapes, watermelons, cantaloupes.
H. A. Myrick, Rohnerville—One lot of tobacco, grown at Rohnerville.
P. Hauck, Rohnerville—Ham, bacon, and lard.
D. F. Briggs, Rohnerville—Lard.

CLASS II.—HORTICULTURAL PRODUCTS.

Mrs. H. Wooldridge, Ferndale—Display of flowers in box or stand, fifteen varieties.
Mrs. H. Drake, Rohnerville—Display of flowers.
Mrs. H. Wooldridge, Ferndale—Two bouquets.
Mrs. M. Perrott, Rohnerville—One bouquet.

FOURTH DEPARTMENT.

CLASS I.—FRUITS.

P. Hauck, Rohnerville—General display of fruit.
L. Painter, Rio Dell—General display of fruit.
H. S. Case, Hydesville—General display of fruit.
J. T. Manon, Rohnerville—General display of fruit.
J. T. Manon, Rohnerville—Five varieties of apples.
L. F. Briggs, Rohnerville—Five varieties of apples.
G. A. Byard, Rohnerville—Five varieties of apples.
P. Hauck, Rohnerville—Five varieties of apples.
Peter Dorr, Rohnerville—Five varieties of apples.
B. Oliver, Rohnerville—Five varieties of apples.
L. Painter, Rio Dell—Five varieties of apples.
L. Painter, Rio Dell—Display of pears.
W. B. Dobyn, Rohnerville—Display of pears.
P. Hauck, Rohnerville—Display of pears.
B. Werner, Rohnerville—Display of pears.
Peter Dorr, Rohnerville—Display of pears.
G. M. Howard, Camp Grant—Display of peaches.
B. Oliver, Rohnerville—Display of peaches.
P. Hauck, Rohnerville—Display of peaches.
P. Dorr, Rohnerville—Display of peaches.
B. Werner, Rohnerville—Display of peaches.
L. Painter, Rio Dell—Display of peaches.
P. Hauck, Rohnerville—Display of quinces.
W. B. Dobyn, Rohnerville—Display of quinces.
B. Werner, Rohnerville—Display of prunes.
G. T. Gushaw, Rohnerville—Display of French and German prunes.
A. H. Bradford, Rohnerville—Display of prunes.
P. Hauck, Rohnerville—Display of prunes.
W. B. Dobyn, Rohnerville—Display of prunes.
P. Hauck, Rohnerville—Display of plums.
L. Painter, Rohnerville—Display of plums.
M. P. Hanson, Rohnerville—Display of plums.
P. Dorr, Rohnerville—Display of plums.
J. T. Manon, Rohnerville—Two bottles currant wine.
J. T. Manon, Rohnerville—Two bottles blackberry wine.

CLASS II.—JELLIES, JAMS, ETC.

Mrs. T. D. Felt, Rohnerville—Display of currant jam.
Clara Dinsmore, Rohnerville—Display of currant jam.
Mrs. J. T. Manon, Rohnerville—Display of currant jam.
Mrs. T. D. Felt, Rohnerville—Display of plum jam.
Mrs. Manon, Rohnerville—Display of plum jam.
Clara Dinsmore, Rohnerville—Display of raspberry jam.
Mrs. H. Drake, Rohnerville—Display of raspberry jam.
Mrs. Gushaw, Rohnerville—Display of raspberry jam.
Mrs. T. D. Felt, Rohnerville—Display of raspberry jam.
Clara Dinsmore, Rohnerville—Display of blackberry jam.
Mrs. Gushaw, Rohnerville—Display of blackberry jam.
Mrs. T. D. Felt, Rohnerville—Display of blackberry jam.
Mrs. H. Drake, Rohnerville—Display of blackberry jam.
Mrs. J. T. Manon, Rohnerville—Display of currant jelly.
Mrs. G. F. Gushaw, Rohnerville—Display of currant jelly.
Mrs. A. W. Gill, Rohnerville—Display of currant jelly.
Mrs. H. Drake, Rohnerville—Display of currant jelly.
Mrs. T. D. Felt, Rohnerville—Display of currant jelly.
Mrs. M. Perrott, Rohnerville—Display of raspberry jelly.
Mrs. Dr. Felt, Rohnerville—Display of raspberry jelly.
Mrs. J. T. Manon, Rohnerville—Display of raspberry jelly.
Mrs. H. Drake, Rohnerville—Display of raspberry jelly.
Mrs. J. T. Mason, Rohnerville—Display of apple jelly.
Mrs. G. F. Gushaw, Rohnerville—Display of apple jelly.
Mrs. T. D. Felt, Rohnerville—Display of apple jelly.
Mrs. J. T. Manon, Rohnerville—Display of blackberry jelly.
Mrs. G. F. Gushaw, Rohnerville—Display of blackberry jelly.
Mrs. A. M. Gill, Rohnerville—Display of blackberry jelly.
Mrs. H. Drake, Rohnerville—Display of blackberry jelly.
Mrs. J. T. Manon, Rohnerville—Display of crabapple jelly.
Mrs. G. F. Gushaw, Rohnerville—Display of crabapple jelly.

Mrs. T. D. Felt, Rohnerville—Display of crabapple jelly.
Mrs. J. T. Manon, Rohnerville—Display of peach jelly.
Mrs. M. Perrott, Rohnerville—Display of peach jelly.
Mrs. J. T. Manon, Rohnerville—Display of quince jelly.
Mrs J. T. Manon, Rohnerville—Display of plum jelly.
Mrs. G. F. Gushaw, Rhonerville—Display of plum jelly.
Mrs. M. Perrott, Rohnerville—Display of plum jelly.
Mrs. T. D. Felt, Rohnerville—Display of plum jelly.
Mrs. A. M. Gill, Rohnerville—Display of watermelon preserves.
Mrs. J. T. Manon, Rohnerville—Display of watermelon preserves.
Mrs. G. F. Gushaw, Rohnerville—Display of tomato preserves.
Mrs. T. D. Felt, Rohnerville—Display of tomato preserves.
Mrs. J. T. Manon, Rohnerville—Display of tomato preserves.
Clara Dinsmore, Rohnerville—Display of currant preserves.
Mrs. T. D. Felt, Rohnerville—Display of currant preserves.
Mrs. J. T. Manon, Rohnerville—Display of crabapple preserves.
Mrs. G. F. Gushaw, Rohnerville—Display of crabapple preserves.
Mrs. J. T. Manon, Rohnerville—Display of pear preserves.
Mrs. M. P. Hanson, Rohnerville—Display of pear preserves.
Mrs. T. D. Felt, Rohnervile—Display of blackberry preserves.
Mrs. G. F. Gushaw, Rohnerville—Display of blackberry preserves.
Clara Dinsmore, Rohnerville—Display of blackberry preserves.
Mrs. M. Perrott, Rohnerville—Display of blackberry preserves.
Mrs. A. W. Gill, Rohnerville—Display of plum preserves.
Mrs. M. Perrott, Rohnerville—Display of plum preserves.
Mrs. T. D. Felt, Rohnerville—Display of plum preserves.
Mrs. J. T. Manon, Rohnerville—Display of cherry preserves.
Mrs. T. D. Felt, Rohnerville—Display of cherry preserves.
Mrs. G. F. Gushaw, Rohnerville—Display of cherry preserves (two varieties.)
Mrs. J. T. Manon, Rohnerville—Display of peach preserves.
Clara Dinsmore, Rohnerville—Display of peach preserves.
Mrs. G. F. Gushaw, Rohnerville—Display of assorted preserves.
Mrs. M. Perrott, Rohnerville—Display of assorted preserves.
Mrs. H. Drake, Rohnerville—Display of assorted preserves.
Mrs. A. M. Gill, Rohnerville—Display of assorted preserves.
Mrs. M. P. Hanson, Rohnerville—Display of assorted preserves.
Mrs. J. T. Manon, Rohnerville—Display of assorted preserves.
Clara Dinsmore, Rohnerville—Display of assorted preserves.
Mrs. G. F. Gushaw, Rohnerville—Display of apple butter.
Mrs. T. D. Felt, Rohnerville—Display of apple butter.
Mrs. J. T. Manon, Rohnerville—Display of apple butter.
Mrs. J. T. Manon, Rohnerville—Display of peach butter.
Mrs. J. T. Manon, Rohnerville—Display of plum butter.
Mrs. J. T. Manon, Rohnerville—Display of tomato butter.
Mrs. J. T. Manon, Rohnerville—General display of jams.
Mrs. T. D. Felt, Rohnerville—General display of jams.
Mrs. G. F. Gushaw, Rohnerville—General display of jams.
Mrs. M. Perrott, Rohnerville—General display of jams.
Clara Dinsmore, Rohnerville—General display of jams.
Mrs. A. W. Gill, Rohnerville—General display of jams.
Mrs. H. Drake, Rohnerville—General display of jams.
Mrs. M. P. Hanson, Rohnerville—General display of jams.
Mrs. J. T. Manon, Rohnerville—General display of jellies.
Mrs. H. Drake, Rohnerville—General display of jellies.
Mrs. A. M. Gill, Rohnerville—General display of jellies.
Mrs. M. P. Hanson, Rohnerville—General display of jellies.
Mrs. M. Perrott, Rohnerville—General display of jellies.
Clara Dinsmore, Rohnerville—General display of jellies.
Mrs. J. T. Manon, Rohnerville—General display of butter.
Mrs. A. M. Gill, Rohnerville—General display of fresh canned fruits.
Mrs. M. P. Hanson, Rohnerville—General display of fresh canned fruits.
Mrs. T. D. Felt, Rhonerville—General display of fresh canned fruits.
Mrs. L. A. Felt, Rohnerville—One lot of dried apples.
P. Dorr, Rohnerville—One lot of dried plums.

FIFTH DEPARTMENT.

CLASS I.—HOUSEHOLD FABRICS.

Mrs. D. Little, Slide Post Office—One rag carpet.
Mrs. Nesbitt, Rohnerville—One rag carpet.

Mrs. F. Simonds, Rohnerville—One rag carpet.
Jessie Maxon. Ferndale—One rag carpet.
Mrs. H. Wooldridge, Ferndale—One rag carpet.
Mrs. Capt. Wright, Rohnerville—One braided rug.
Mrs. A. H. Bradford, Rohnerville—One braided rug.
Mrs. A. Hibbert, Rohnerville—One worsted rug.
Mrs. J. E. Still, Rohnerville—One worsted rug.
Mrs. A. Laboryteaux, Rohnerville—One worsted rug.
Mrs. C. Hyer, Rohnerville—One worsted rug.
Mrs. J. L. Eby, Rohnerville—One worsted rug.
Mrs. C. A. Decker, Rohnerville—One worsted rug.
Mrs. A. J. Tyrrell, Rohnerville—One worsted rug.
Mrs. M. G. Lithgow, Rohnerville—One worsted rug.
Mrs. Nesbitt, Rohnerville—One pillow sham.
Mrs. Gill, Rohnerville—One pillow sham.
Mrs. H. Hibbert, Rohnerville—One pillow sham.
Mrs. A. J. Tyrrell, Ferndale—One pillow sham.
Mrs. Mark Bugbee, Rohnerville—One suit hand-made boys clothes.
Mrs. M. G. Lithgow, Rohnerville—One patched garment.
Mrs. M. Perrott, Rohnerville—One sofa pillow.
Mrs. Nesbitt, Rohnerville—One sofa pillow.
Mrs. H. Hibbert, Rohnerville—One sofa pillow.
Mrs. M. G. Lithgow, Rohnerville—One sofa pillow.
Mrs. H. S. Case, Hydesville—One bedspread.
Mrs. Nesbitt, Rohnerville—One bedspread.
Mrs. A. Gries, Ferndale—One bedspread.
Mrs. George A. Kellogg, Rohnerville—One child's dress.
Mrs. Martha Felt, Rohnerville—One arranged log cabin quilt.
Mrs. M. Bugbee, Ferndale—One arranged log cabin quilt.
Mrs. J. L. Eby, Rohnerville—One arranged log cabin quilt.
Mrs. H. McWhinney, Ferndale—One arranged log cabin quilt.
Mrs. Joseph Tracy, Hydesville—One arranged log cabin quilt.
Mrs. M. Miner, Ferndale—One arranged log cabin quilt.
Mrs. Frost, Rohnerville—One arranged log cabin quilt.
Mary Lindley, Rohnerville—One silk patchwork quilt.
Mrs. H. S. Case, Hydesville—Two cotton patchwork quilts.
Mrs. McCrag, Eureka—One cotton patchwork quilt.
Mrs. J. D. Barber, Slide—One cotton patchwork quilt.
Mrs. S. Little, Slide—One cotton patchwork quilt.
Mrs. A. Gill, Ferndale—One cotton patchwork quilt.
Jessie Maxon, Ferndale—One cotton patchwork quilt.
Mrs. E. Wright, Rohnerville—One cotton patchwork quilt.
Mrs. A. D. Smith, Rohnerville—One cotton patchwork quilt.
Mrs. M. E. Robinson, Rohnerville—One worsted quilt.
Mrs. Miner, Ferndale—One worsted quilt.
Jessie Maxon, Ferndale—One worsted quilt.
Mrs. A. H. Bradford, Rohnerville—One worsted quilt.
Mrs. A. Gries, Ferndale—One specimen of quilting.
Mrs. H. McWhinney, Ferndale—One specimen of quilting.
Mrs. Martha Felt, Rohnerville—One specimen of quilting.
Mrs. M. Perrott, Rohnerville—One specimen of quilting.

BY MISS UNDER TWELVE YEARS.

Miss Jordan, Rohnerville—One patchwork quilt.
Miss Gries, Ferndale—One patchwork quilt.
Miss Emily Gould, Hydesville—One patchwork quilt.

CLASS II.—EMBROIDERY, CROCHET, TATTING, ETC.

Mrs. DeFarrar, Hydesville—One worsted crochet tidy.
Mrs. J. D. Barber, Slide—One worsted crochet tidy.
Mrs. M. Perrott, Rohnerville—Two cotton crochet tidies.
Mrs. A. H. Bradford, Rohnerville—One cotton crochet tidy.
Belle Dahle, Rohnerville—One cotton crochet tidy.
Mrs. Nesbitt, Rohnerville, one cotton crochet tidy.
Mrs. E. Zeigler, Rohnerville—One cotton crochet tidy.
Mrs. J. R. Jordan, Rohnerville—One cotton crochet tidy.
Emma Simonds, Rohnerville—One cotton crochet tidy.
Mrs. A. A. Myrick, Rohnerville—Two knit tidies.
Mrs. I. H. Leach, Rohnerville—One knit tidy.
Mrs. G. A. Kellogg, Rohnerville—One knit tidy.
Mrs. M. Bugbee, Rohnerville—One knit tidy.

Mrs. DeFarrar, Hydesville—Nine canvas tidies.
Miss E. Clark, Eureka—One crochet toilet set.
Mrs. C. Drucker, Rohnerville—One crochet toilet set.
Mrs. M. Perrott, Rohnerville—One crochet toilet set.
Mrs. Forsyth, Rohnerville—One crochet lamp mat.
Mrs. Ellen Galloway, Ferndale—One embroidered infant's dress.
Mrs. H. Winzler, Ferndale—One embroidered infant's dress.
Mrs. E. Galloway, Ferndale—One embroidered chemise yoke and sleeves.
Mrs. E. Galloway, Ferndale—One embroidered collar.
Mrs. E. Galloway, Ferndale—One pair embroidered gloves.
Mrs. E. Galloway, Ferndale—One embroidered night dress and shirt bosom.
Mrs. E. Galloway, Ferndale—One specimen of silk embroidery.
Mrs. C. W. Long, Rohnerville—One specimen of silk embroidery.
Mrs. Geo. A. Kellogg, Rohnerville—One specimen of silk embroidery.
Mrs. M. Perrott, Rohnerville—One specimen of silk embroidery.
Mrs. E. Galloway, Ferndale—One specimen of cotton embroidery.
Mrs. A. H. Bradford, Rohnerville—One specimen of cotton embroidery.
Mrs. E. Galloway, Ferndale—One specimen of worsted embroidery.
Emma Simonds, Rohnerville—One specimen of worsted embroidery.
Miss C. Drucker, Rohnerville—One toilet cushion.
Mrs. A. J. Tyrrell, Rohnerville—One sample of tatting.
Mrs. H. M. Whinney, Ferndale—One sample of tatting.

CLASS III.—ORNAMENTAL.

Mrs. M. Perrott, Rohnerville—One hair wreath.
Miss Van Duser, Table Bluff—One hair wreath.
Mrs. Nesbitt, Rohnerville—One hair wreath.
Mrs. H. Drake, Rohnerville—One feather wreath.
Miss Belle Dable, Rohnerville—One feather wreath.
Mrs. Dr. Farrar, Hydesville—One feather wreath.
Mrs. Brine, Hydesville—One worsted wreath.
Mrs. H. Drake, Rohnerville—One worsted wreath.
Mrs. W. H. Byard, Rohnerville—One worsted wreath.
Mrs. A. H. Bradford, Rohnerville—One sample fancy work in feathers.
Rosa Gibson, Hydesville—One sample fancy work on cardboard.
Mrs. A. H. Bradford, Rohnerville—One sample fancy work in zephyr flowers.
Miss L. Gibson, Hydesville—One sample fancy work on cardboard.
Mrs. H. Drake, Rohnerville—One sample fancy work on cardboard.
Mrs. T. D. Felt, Rohnerville—One sample fancy work on cardboard.
Mrs. I. Finch, Rohnerville—One hanging basket.
Mrs. H. Drake, Rohnerville—Display of hanging basket of flowers.

CLASS IV.—PAINTING, PENMANSHIP, ETC.

Mrs. M. G. Lithgow, Rohnerville—One photograph in water colors.
Mrs. M. G. Lithgow, Rohnerville—One pencil drawing,
Miss W. M. Barksdale, Ferndale—One specimen penmanship.
Mrs. C. Williams, Hydesville—One specimen penmanship.
J. R. Bugbee, Ferndale—One specimen penmanship.
C. W. Lillie, Ferndale—One specimen penmanship.
Jessie Smith, Rohnerville—One specimen penmanship.
Mrs. G. W. Stone, Rohnerville—One display of birds.
Mrs. J. L. Eby, Rohnerville—One display of birds.
Mrs. W. B. Dobbyn, Rohnerville—One display of birds.
Mrs. M. Van Sickle, Rohnerville—One display of birds.

PREMIUMS AWARDED—1880.

FIRST DEPARTMENT.

Live Stock.	Owner.	Residence.	Animal.	Premium.
Best stallion, for heavy draft	W. H. E. Smith	Rohnerville	Santa Claus	$20 00
Best stallion, for all work	W. J. Lindley	Rohnerville	Morgan	20 00
Second best stallion, for all work	W. M. Bohall	Arcata	Fred	10 00
Best roadster	Curt. Lewis	Ferndale	Robert Bonner	20 00
Second best roadster	C. W. Long	Eureka	Hambletonian	10 00
Best brood mare, with colt	Dr. T. D. Felt	Rohnerville	Queen	15 00
Second best brood mare, with colt	L. Hurlburt	Ferndale	No name	10 00
Best sucking colt	L. Hurlburt	Ferndale	No name	5 00
Second best sucking colt	B. Robinson	Rohnerville	Katie Cloud	2 50
Best family of four colts, same sire; premium, $20; to be divided among owners thereof	Geo. Jordan	Rohnerville	Lizzie	5 00
	H. S. Case	Hydesville	Pinafore	5 00
	M. Perrott	Rohnerville	Fan	5 00
	B. Robinson	Rohnerville	Katie Cloud	5 00
CLASS II.—CATTLE.				
Best bull, three years and over	A. Bulme	Eureka	Ben	$20 00
Second best bull, three years and over	A. Bulme	Eureka	Volunteer	10 00
Best bull, three years and under	Jos. Russ	Ferndale	Roderick	10 00
Second best bull, three years and under	J. K. Shannahan	Eureka	Golden	5 00
Best milch cow, three years and over	J. K. Shannahan	Eureka	Fannie	10 00
Second best milch cow, three years and over	Ira Doty	Rohnerville	Pet	5 00
Best heifer, two years and over	Jas. Russ	Ferndale	Rose	5 00
CLASS III.—SHEEP.				
Best Cotswold ram	S. H. Leach	Rohnerville	Sam	$10 00
Best Merino ram	J. R. Jordan	Rohnerville	Dick	10 00
Second best Merino ram	S. H. Leach	Rohnerville	Jack	5 00
CLASS IV.—SWINE.				
Best boar, of any age or breed	L. F. Briggs	Rohnerville	Sam (Essex)	$10 00
Second best boar, of any age or breed	L. C. Beckwith	Hydesville	Cromwell	5 00
Best brood sow, with pigs	L. F. Briggs	Rohnerville	Mary Jane	10 00
Second best brood sow, with pigs	L. C. Beckwith	Hydesville	Queen	5 00

First Department—Continued.

Live Stock.	Owner.	Residence.	Animal.	Premium.
CLASS V.—POULTRY.				
Best pair chickens, cock and hen	P. Hauck	Rohnerville		$3 00
Best pair geese	R. Bryant	Rohnerville		3 00
Best display of poultry	P. Hauck	Rohnerville		5 00
Second best display of poultry	R. Bryant	Rohnerville		2 50

SECOND DEPARTMENT.

MECHANICAL.

James Thompson, Rohnerville—Best display of brick made in district, $5.
P. Perry, Rohnerville—Best farm wagon, $10.
Rowle & Holmes, Eureka—Best open buggy, $10.
A. D. Smith, Rohnerville—Best shod horse, light work, $5.
A. D. Smith, Rohnerville—Best shod horse, heavy work, $5.
A. P. Compton, Rohnerville—Best invented gate, $10.
P. W. Johnson, Rohnerville--Best display of leather, $6.
I. H. Crabtree, Rohnerville—Best spring bed, $5.
Miss Lizzie Evarts—Best pair buckskin gloves, $2.

THIRD DEPARTMENT.

CLASS I.—AGRICULTURAL PRODUCTS.

Best barrel flour, by manufacturer—Rohnerville Star Mills, $5.
Best five pounds butter—Miss L. Howe, Eureka, $2.
Second best five pounds butter—Mrs. A. Hibbert, Rohnerville, $1.
Best fifty pounds butter three months old—A. Gill, Ferndale, $5.
Best cheese—E. Ziegler, Rohnerville, $3.
Second best cheese—Mrs. William Taylor, Rohnerville, $2.
Best one bushel wheat—H. Drake, Rohnerville, $2.
Second best one bushel wheat—Boyd Oliver, Rohnerville, $1.
Best bushel oats—John Blanton, Rohnerville, $2.
Second best bushel oats—J. R. Stevens, Rohnerville, $1.
Best bushel barley—B. Oliver, Rohnerville, $2.
Second best bushel barley—George A. Byard, Rohnerville, $1.
Best bushel peas—L. F. Briggs, Rohnerville, $2.
Second best bushel peas—B. Robinson, Rohnerville, $1.
Best two sheaves of wheat—H. Drake, Rohnerville, $2.
Second best two sheaves of wheat—E. Hicklin, Rohnerville, $1.
Best homemade wheat bread—Mrs. A. Hibbert, Rohnerville, $2.
Second best homemade wheat bread—Mrs. A. M. Gill, Rohnerville, $1.
Best homemade wheat bread by Miss under fourteen years—Jessie Martin, Rohnerville, $2.
Second best homemade wheat bread by Miss under fourteen years—Mary Patmore, $1.
Best pan of biscuit—Mrs. A. M. Gill, Rohnerville, $1.
Second best pan of biscuit—Emma Simonds, Rohnerville, $1.
Best pan of biscuit by Miss under fourteen years—Jessie Martin, Rohnerville, $2.
Second best pan of biscuit by Miss under fourteen years—Mary Patmore, Rohnerville, $1.
Best exhibit of beets—Job Tower, Eureka, $2.
Second best exhibit of beets—Daniel Snider, Slide Postoffice, $1.
Best exhibit of turnips—Daniel Snider, Slide Postoffice, $2.
Best exhibit of carrots—P. Hauck, Rohnerville, $2.
Second best exhibit of carrots—Job Tower, Eureka, $1.
Best exhibit of squashes—Job Tower, Eureka, $2.
Second best exhibit of squashes—P. Hauck, Rohnerville, $1.
Best exhibit of cabbage—P. Hauck, Rohnerville, $2.
Best bushel of potatoes—G. M. Howard, Camp Grant, $5.
Second best bushel of potatoes—Dr. J. L. Eby, Rohnerville, $2 50.
Best display of potatoes—Job Tower, Eureka, $5.
Best display of sweet potatoes—G. M. Howard, Camp Grant, $2.
Best display of onions—G. M. Howard, Camp Grant, $2.

CLASS II.—FLOWERS.

Best display of flowers, not less than fifteen varieties, in box or stand—Mrs. H. Wooldridge, Ferndale, $10.
Second best display of flowers, not less than fifteen varieties, in box or stand—Mrs. H. Drake, Rohnerville, $5.
Best bouquet—Mrs. H. Wooldridge, Ferndale, $3.
Second best bouquet—Mrs. M. Perrott, Rohnerville, $2.
Third best bouquet—Mrs. Wooldridge, Ferndale, $1.

FOURTH DEPARTMENT.

CLASS I.—FRUITS.

Best general display of fruits of all kinds—P. Hauck, Rohnerville, $15.
Best five varieties of apples correctly named—J. T. Manon, Rohnerville, $10.
Best display of pears—L. Painter, Rio Dell, $2.
Best display of peaches—G. M. Howard, Camp Grant, $2.
Best display of quinces—P. Hauck, Rohnerville, $2.
Best display of prunes—A. H. Bradford, Rohnerville, $2.
Best display of plums—P. Hauck, Rohnerville, $2.
Best display of currant wine—J. T. Manon, Rohnerville, $2.
Best display of blackberry wine—J. T. Manon, Rohnerville, $2.

CLASS II.—JELLIES, JAMS, ETC.

Best currant jam—Mrs. J. T. Manon, Rohnerville, $2.
Best plum jam—Mrs. T. D. Felt, Rohnerville, $2.
Best raspberry jam—Clara Dinsmore, Rohnerville, $2.
Best blackberry jam—Clara Dinsmore, Rohnerville, $2.
Best currant jelly—Mrs. J. T. Manon, Rohnerville, $2.
Best raspberry jelly—Mrs. M. Perrott, Rohnerville, $2.
Best blackberry jelly—Mrs. J. T. Manon, Rohnerville, $2.
Best apple jelly—Mrs. J. T. Manon, Rohnerville, $2.
Best crabapple jelly—Mrs. J. T. Manon, Rohnerville, $2.
Best peach jelly—Mrs. J. T. Manon, Rohnerville, $2.
Best quince jelly—Mrs. J. T. Manon, Rohnerville, $2.
Best plum jelly—Mrs. J. T. Manon, Rohnerville, $2.
Best watermelon preserves—Mrs. A. M. Gill, Rohnerville, $2.
Best tomato preserves—Mrs. G. F. Gushaw, Rohnerville, $2.
Best currant preserves—Clara Densmore, Rohnerville, $2.
Best crabapple preserves—Mrs. J. T. Manon, Rohnerville, $2.
Best pear preserves—Mrs. J. T. Manon, Rohnerville, $2.
Best quince preserves—Mrs. J. T. Manon, Rohnerville, $2.
Best blackberry preserves—Mrs. T. D. Felt, Rohnerville, $2.
Best plum preserves—Mrs. A. W. Gill, Rohnerville, $2.
Best cherry preserves—Mrs. T. D. Felt, Rohnerville, $2.
Best peach preserves—Mrs. J. T. Manon, Rohnerville, $2.
Best display of preserves—Mrs. G. F. Gushaw, Rohnerville, $5.
Best display of apple butter—Mrs. G. F. Gushaw, Rohnerville, $2.
Best display of peach butter—Mrs. J. T. Manon, Rohnerville, $2.
Best display of plum butter—Mrs. J. T. Manon, Rohnerville, $2.
Best display of tomato butter—Mrs. J. T. Manon, Rohnerville, $2.
Best display of jams—Mrs. J. T. Manon, Rohnerville, $5.
Best display of jellies—Mrs. J. T. Manon, Rohnerville, $5.
Best display of butter—Mrs. J. T. Manon, Rohnerville, $5.
Best display of fresh canned fruits—Mrs. A. M. Gill, Rohnerville, $5.
Second best display of fresh canned fruits—Mrs. M. P. Hanson, Rohnerville, $2 50.
Best display of dried apples—L. A. Felt, Rohnerville, $2.
Best display of dried plums—P. Derr, Rohnerville, $2.

FIFTH DEPARTMENT.

CLASS I.—HOUSEHOLD FABRICS.

Best rag carpet—Mrs. D. Little, Slide Post Office, $5.
Best braided rug—Mrs. Capt. Wright, Rohnerville, $3.
Best worsted rug—Mrs. A. Hebbert, Rohnerville, $3.

Second best worsted rug—Mrs. J. E. Still, Eureka, $1 50.
Best pillow sham—Mrs. Nesbitt, Rohnerville, $2.
Second best pillow sham—Mrs. A. J. Tyrrell, Rohnerville, $1.
Best suit of boys' clothes, hand made—Mrs. M. Bugbee, Ferndale, $3.
Best patched garment—Mrs. M. G. Lithgow, Rohnerville, $1.
Best sofa pillow—Mrs. M. Perrott, Rohnerville, $2.
Best bedspread—Mrs. H. S. Case, Hydesville, $2.
Second best bedspread—Mrs. Maggie Simpson, Table Bluff, $1.
Best child's dress—Mrs. Geo. A. Kellogg, Rohnerville, $2.
Best arranged log cabin quilt—Mrs. Martha Felt, Rohnerville, $5.
Best patchwork quilt (silk)—Mary Lindley, Rohnerville, $4.
Best patchwork quilt (cotton)—Mrs. H. S. Case, Hydesville, $4.
Second best patchwork quilt (cotton)—Mrs. McCrag, Eureka, $2.
Best patchwork quilt (worsted)—Mrs. M. E. Robinson, Rohnerville, $4.
Second best patchwork quilt (worsted)—Mrs. Miner, Ferndale, $2.
Best specimen of quilting—Mrs. A. Gries, Ferndale, $3.
Second best specimen of quilting—Mrs. H. McWhinney, Ferndale, $1 50.

CLASS II.—EMBROIDERY, ETC.

Best worsted crochet tidy—Mrs. DeFarrar, Hydesville, $3.
Best cotton crochet tidy—Mrs. M. Perrott, Rohnerville, $3.
Second best cotton crochet tidy—Mrs. A. H. Bradford, Rohnerville, $1 50.
Best knit tidy—Mrs. H. A. Myrick, Rohnerville, $3.
Second best knit tidy—Mrs. H. A. Myrick, Rohnerville, $1 50.
Best canvas tidy—Mrs. DeFarrar, Hydesville, $3.
Second best canvas tidy—Mrs. DeFarrar, Hydesville, $1 50.
Best crochet toilet set—Mrs. M. Perrott, Rohnerville, $2.
Best lamp mat—Mrs. Forsyth, Rohnerville, $1.
Best embroidered infant's dress—Mrs. E. Galloway, Ferndale, $1.
Best embroidered chemise yoke and sleeves—Mrs. E. Galloway, Ferndale, $2.
Best embroidered collar—Mrs. E. Galloway, Ferndale, $1.
Best embroidered pair of gloves—Mrs. E. Galloway, Ferndale, $1.
Best specimen of silk embroidery—Mrs. E. Galloway, Ferndale, $1.
Best specimen of cotton embroidery—Mrs. E. Galloway, Ferndale, $1.
Best specimen of worsted embroidery—Mrs. E. Galloway, Ferndale, $1.
Best toilet cushion—Mrs. C. Drucker, Rohnerville, $1.
Best specimen of tatting—Mrs. A. J. Tyrrell, Rohnerville, $1.
Second best specimen of tatting—Mrs. H. McWhinney, Ferndale, 50 cents.

CLASS III.—ORNAMENTAL.

Best hair wreath—Mrs. M. Perrott, Rohnerville, $2.
Second best hair wreath—Mrs. Van Duzer, Table Bluff, $1.
Best feather wreath—Mrs. H. Drake, Rohnerville, $2.
Second best feather wreath—Miss Belle Dahle, Rohnerville, $1.
Best worsted wreath—Mrs. Brine, Hydesville, $2.
Second best worsted wreath—Mrs. H. Drake, Rohnerville, $1.
Best specimen of work in feathers—Mrs. A. H. Bradford, Rohnerville, $2.
Best specimen of work on cardboard—Rosa Gibson, Hydesville, $2.
Best specimen of zephyr flowers—Mrs. A. H. Bradford, Rohnerville, $2.
Best hanging basket—Mrs. S. Finch, Rohnerville, $1.

CLASS IV.—PAINTING, PENMANSHIP, ETC.

Best water color—Mrs. M. G. Lithgow, Rohnerville, $2.
Best pencil drawing—Mrs. M. G. Lithgow, Rohnerville, $2.
Best specimen of penmanship—Mrs. W. M. Barksdale, Ferndale, $4.
Second best specimen of penmanship—J. R. Bugbee, Ferndale, $2.
Best specimen of penmanship by child under fourteen years—C. W. Lillie, Ferndale, $4.
Best display of birds—Mrs. George W. Stone, Rohnerville, $5.
Second best display of birds—Mrs. J. L. Eby, Rohnerville, $2 50.

RECEIPTS AND EXPENDITURES.

Receipts	$1,638 50	
Indebtedness	631 94	
		$2,270 44
Expenditures—To amount paid premiums and purses	$1,546 00	
To expenses	724 44	
		$2,270 44

Not having a building suitable wherein to display our exhibits, we were compelled to erect one, at a cost of five hundred and fifty-seven dollars; hence our indebtedness. With the State appropriation, and amounts received by private subscription to the Pavilion Fund, the Society will be almost clear of debt.

All of which is respectfully submitted.

I. H. CRABTREE, Secretary.

TRANSACTIONS

OF THE

Mount Shasta Agricultural Association,

District No. 10,

Composed of the Counties of Siskiyou, Trinity, and Shasta.

1880.

OFFICERS OF THE ASSOCIATION.

OFFICERS OF THE BOARD.

W. S. STONE	President.
J. B. ROHRER	Vice President.
J. H. MAGOFFEY	Secretary.
M. RENNER	Treasurer.

BOARD OF DIRECTORS.

L. SWAN	Yreka.
H. KNIGHT	Yreka.
S. MAGOFFEY	Yreka.
A. B. CARLOCK	Fort Jones.
C. C. BUSH	Reading.
JOHN M. OWINGS	Trinity Valley.

Finance Committee—W. S. Stone, J. H. Magoffey, C. C. Bush, L. Swan, and H. Knight.

Track Committee—W. S. Stone, H. Knight, and S. Magoffey.

Pavilion Committee—L. Swan, J. B. Rohrer, and J. F. Davis.

Amusement Committee—A. E. Raynes, Theo. Young, and L. Huseman.

REPORT.

YREKA, December 17, 1880.

To the honorable the State Board of Agriculture:

I hand you herewith the report of the Mount Shasta Agricultural Society, (Tenth District). The First Annual Fair of the Mount Shasta Agricultural Society (Tenth District), was held on the 13th, 14th, 15th, and 16th of October, 1880.

Owing to the lateness of organizing the Society, which prevented notice of holding the Fair being sent to different parts of the district in time to allow the people to prepare for it, the entries to stock and the Pavilion were not as full as at former county Fairs, though the articles and animals exhibited were of a high grade. However, the Fair was a success financially with the State aid. The weather was pleasant and everybody had a good time. I inclose premium list and financial statement.

Hoping the other Agricultural Societies enjoyed the same success as we did, we remain yours, etc.,

W. S. STONE, President.

J. H. MAGOFFEY, Secretary.

PREMIUMS AWARDED—1880.

FIRST DEPARTMENT—HORSES.

CLASS I.—THOROUGHBREDS.

(No entries.)

CLASS II.—GRADED.

J. H. Magoffey, Yreka, b. s. Siskiyou Boy, $30.
A. D. Richards, Yreka, b. c., (no name,) $20.

CLASS III.—HORSES OF ALL WORK.

William Eckhart, Yreka, br. s. Anything, $25.

CLASS IV.—DRAFT HORSES.

D. B. Cassidy, Little Shasta, gr. s. Mountain Buck, $25.
J. R. Kinyon, Fort Jones, s. m. Em, $15.

(No entries in classes five, six, seven, and eight.)

CLASS IX.—JACKS AND MULES.

N. H. Eddy, Little Shasta, blk. jack Mount Shasta Dick, $25.

SECOND DEPARTMENT—CATTLE.

CLASS I.

H. L. Davis, Little Shasta—Durham bull, Dick, $25.
D. Deter, Little Shasta—Durham calf, Captain Jack 2d, $15.
D. Deter, Little Shasta—Durham cow, Belle of Shasta, $15.
D. Deter, Little Shasta—Durham cow, Nelly, two years, $10.
J. R. Kinyon, Fort Jones—Devon cow, Belle, three years, $15.
H. L. Davis, Little Shasta—Durham bull, Dick, sweepstakes, $15.
D. Deter, Little Shasta—Durham calf, Minnie May, sweepstakes, $10.
D. Deter, Little Shasta—Durham cow, Belle of Shasta, sweepstakes, $10.

THIRD DEPARTMENT—SHEEP.

CLASS 1.

L. Huseman, Yreka—Best ram, two years and over, $15.
L. Huseman, Yreka—Best two ewes, $15.

(No entries in class two—goats.)

FOURTH DEPARTMENT—SWINE.

Barney McGarrahan, Yreka—Boar, under one year, $5.
Barney McGarrahan, Yreka—Sow, under one year, $5.

SIXTH DEPARTMENT.

MACHINERY, IMPLEMENTS, ETC.

Wehrbass & Harmon, Yreka—Two miners' picks, $2 50.
Wehrbass & Harmon, Yreka—Two-horse family carriage, $10.
L. Swan, Yreka—Top buggy, $8.

SEVENTH DEPARTMENT.

NEEDLE, SHELL, AND WAX WORK, CLOTHING, ETC.

Mrs. S. A. Burrows, Yreka—Hand braiding, $2.
Miss Mary Davis, Little Shasta—Java canvas tidy, $2.
Mrs. George Peck, Yreka—Child's afghan, $2 50.
Mary Agnes Miner, Yreka—Pincushion, $1 50.
Mrs. S. A. Burrows, Yreka—Darned netting, $2.
Miss Eliza Strickland, Yreka—Knit tidy, $1.
Miss Eva Crawl, Yreka—Crochet, $2.
Miss Dora Junker, Yreka—Bead guard, $1.
Mrs. Munro, Yreka—Silk embroidering, $3.
Mrs. Munro, Yreka—Silk hand braiding, $1 50.
Mrs. C. C. Cornish, Yreka—Silk quilt, $5.
Miss Hattie Davis, Little Shasta—Patchwork quilt, $2 50.
Mrs. H. L. Davis, Little Shasta—Log cabin bedspread, $2 50.
Miss Carrie Swan, Yreka—Button rug, $2.
Miss Mary Pachburg, Yreka—Worsted flower bouquet, $1 50.
Miss Ada Payne, Yreka—Zephyr flowers, honorable mention.
Mrs. Munro, Yreka—Lace embroidery, $1.
Miss Ida Stimmel, Yreka—Pair cornucopias, $1.
Miss Ida Stimmel, Yreka—Tidy, $1.
Miss Aggie Vance, Yreka—Toilet set, $2 50.
Miss Aggie Vance, Yreka—Lace tidy, $1 50.
Miss Aggie Vance, Yreka—Crocheting and knitting, $1.
Miss Aggie Vance, Yreka—Hairpin case, $1.
Miss Aggie Vance, Yreka—Best exhibit in department, $10.
Mrs. Alice Green, Yreka—Best exhibit ladies' underwear, $2 50.
Mrs. E. Ranous, Yreka—Best exhibit hand sewing, $2 50.
Mrs. Annie Stimmel, Yreka—Best exhibit hand braiding, $1 50.
Mrs. Wm. Hutchinson, Fort Jones—Best homemade woolen stockings, $1.
Mrs. Wordheim, Yreka—Best homemade cotton stockings, $1.
Miss Vesta Orr, Shasta Valley—Silver cardboard brush case, $1.

Mrs. Geo. Peck, Yreka—Specimen darning, $1.
J. H. Magoffey, Yreka—Penmanship sweepstake, $5.
Annie Lash, Yreka—Penmanship, $2 50.
Allie Shearer, Yreka—Penmanship, $2 50.
Miss Nelia Hawkins, Yreka—Pencil drawing, $5.
Mrs. Schofield, Yreka—Autumn wreath, $1 50.
Miss Mary Wetzel, Yreka—Worsted picture, $5.
Mrs. Munro, Yreka—Hair wreath, $2 50.
Mrs. Schofield, Yreka—Skeleton wreath, $1 50.
Mrs. S. A. Burrows, Yreka—Bleached sea-moss cross, $2.
Geo. Wetzel, Yreka—Drawing, $5.
Miss Martha Knight, Yreka—Worsted crochet, $2.

AGRICULTURAL PRODUCTS.

Samuel Jackson, Edgewood—Best display of bacon, $5.
W. J. Evans, Little Shasta—Best display of wool, $5.
N. H. Eddy, Edgewood—Best wheat, $2 50.
N. H. Eddy, Edgewood—Best beans, $2 50.
J. R. Kinyon, Fort Jones—Sugar beet, $2 50.
Mrs. C. McNulty, Yreka—Marblehead cabbage, $2 50.
Samuel Jackson, Edgewood—Squash, $2 50.
Samuel Jackson, Edgewood—Broom corn, $2 50.
Samuel Jackson, Edgewood—Pumpkin, $2 50.
J. B. Rohrer, Little Shasta—Golden Mellen barley, $2 50.
J. B. Rohrer, Little Shasta—Common barley, $2 50.
Samuel Jackson, Edgewood—Best ten varieties of apples, $5.
Samuel Jackson, Edgewood—Best varieties of apples, $2 50.
Mrs. George Peck, Yreka—Best three varieties of apples, $5.
Mrs. George Peck, Yreka—Best display of dried fruit, $3.
Mrs. Schofield, Yreka—Clingstone peaches, $2 50.
Mrs. Thomas Orr, Shasta Valley—Cider vinegar, $1 50.
Mrs. George Fried, Yreka—Currant wine, $2.

BUTTER, BREAD, ETC.

Miss Carrie Swan, Yreka—Wild plum butter, $1 50.
Miss Martha Knights, Yreka—Fresh currants, $1.
Mrs. H. Repp, Yreka—Fresh plums, $1.
Mrs. H. L. Davis, Little Shasta—Fresh peaches, $1.
Mrs. H. L. Davis, Little Shasta—Fresh pears, $1.
Miss Martha Knights, Yreka—Fresh cherries, $1.
Carrie Swan, Yreka—Preserved crabapples, $1.
Miss S. L. Bigelow, Yreka—Wild plums (canned), $1.
Mrs. H. L. Davis, Shasta Valley—Wild plum butter, $1 50.
Miss Aggie Vance, Yreka—Fresh blackberries, $1.
Miss Martha Knights, Yreka—Preserved currants, $1.
Miss Martha Knights, Yreka—Fresh tomatoes, $1.
Mrs. George Campbell, Soda Springs—Apple jelly, $1 50.
Miss Martha Knights, Yreka—Currant jelly, $1 50.
Miss Aggie Vance, Yreka—Crabapple jelly, $1 50.
Miss S. L. Bigelow, Shasta Valley—Cherry jelly, $1 50.
Mrs. John Pashburg, Yreka—Wild plum jelly, $1 50.
Mrs. H. L. Davis, Little Shasta—Elderberry jelly, $1 50.
Miss S. L. Bigelow, Shasta Valley—Huckleberry jelly, $1 50.
Miss Carrie Swan, Yreka—Green gage plum jelly, $1 50.
Miss Aggie Vance, Yreka—Grape jelly, $1 50.
Mrs. H. L. Davis, Little Shasta—Tomato catsup, $1 50.
Miss Mary Magoffey, Yreka—Grape catsup, $1 50.
Miss Martha Knights, Yreka—Pickled peaches, $1 50.
Miss Lulu Vance, Yreka—Tomato pickles, $1 50.
Mrs. H. Repp, Yreka—Melon mangoes, $1 50.
Miss Ida Ranous, Yreka—Pickled onions, $1 50.
Miss Ida Ranous, Yreka—Mixed pickles, $1 50.
Mrs. John Pashburg, Yreka—Pickled pears, $1 50.
Mrs. Thomas Orr, Shasta Valley—Honey, $2.
Mrs. Thomas Orr, Shasta Valley—Beeswax, $1.
Jensen & Riley, Yreka—Butter (firkin), $5.
Mrs. W. J. Evans, Little Shasta—Fresh butter, $5.
Jensen & Riley, Yreka—Cheese, $5.
Miss S. L. Bigelow, Shasta Valley—Canned grapes, $1.
Miss Mary Magoffey, Yreka—Sponge cake, $1.
Miss Mary Pashburg, Yreka—Sponge cake, special premium, $1.

Miss Ida Ranous, Yreka—Jelly cake, $2.
Miss Ida Ranous, Yreka—Raised biscuit, $2.
Jensen & Riley, Yreka—Baker's bread, $2.
Jensen & Riley, Yreka—Pound cake, $3.
Jensen & Riley, Yreka—Crackers, $2.
Mrs. Charles Herzog, Sr., Yreka—Fruit and jelly doughnuts, $1.
Mrs. H. Repp, Yreka—Four varieties of tarts, $1 50.
Mrs. H. Repp, Yreka—Pickled cabbage, $1 50.

FINE ARTS.

J. H. Magoffey, Yreka—Penmanship, $2.
Miss Eva Crawl, Yreka—Photograph (Grecian), $2 50.
Herman Brinzer, Yreka—Specimens of draughting, $5.
Miss S. L. Bigelow, Shasta Valley—Picture frame, $2 50.
Miss S. L. Bigelow, Shasta Valley—Picture frame, $2 50.

MISCELLANEOUS.

H. Duenkel, Yreka—Sample salt, $2 50.
F. G. Hearn, Yreka—Mineral ores, $10.
Mrs. E. Ranous, Yreka—Best exhibit house plants, $5.
Mrs. Nehrbass, Yreka—Second best exhibit house plants, chromo.
Mrs. E. Ranous, Yreka—Cut flowers, honorable mention.
Mrs. D. Ream, Yreka—Best bouquet, $1.
Mrs. J. Kessler, Yreka—Japanese plant, honorable mention.

FINANCIAL REPORT.

RECEIPTS.

Received from badges	$554 00
Received from gate	409 40
Received from pools	177 25
Received from entries to stock	68 00
Received from door receipts	52 50
Received from the State	800 00
	$2,061 15

EXPENDITURES.

Disbursed for purses	$830 00
Disbursed for improvements on grounds, etc.	124 20
Disbursed for expenses, including payment of premiums	1,074 75
Balance	34 20
	$2,061 15

TRANSACTIONS

OF THE

Plumas, Lassen, Sierra, and Modoc District Association,

District No. 11,

Composed of the above named Counties.

1880.

OFFICERS OF THE ASSOCIATION.

E. D. HOPELKUS	President.
J. D. COMPTON	Treasurer.
W. D. FLETCHER	Secretary.

DIRECTORS.

J. W. THOMPSON,
JOHN McBETH,
C. H. LAWRENCE,
DANIEL NEUMAN,
E. D. HOPELKUS,
L. H. BURNNELL.

REPORT.

I. N. Hoag, Secretary State Board of Agriculture, Sacramento:

Dear Sir: I herewith send you statement of premiums awarded by our District, No. 11; also, statement of total receipts and disbursements, which I trust will meet your approval. Considering this was the first Fair ever held in the place, or in the district, it was a grand success. Another year it will be better, as we will be able to offer larger premiums, which will be an inducement for parties to come from more remote parts of the district.

Yours respectfully,
W. D. FLETCHER, Secretary.

RECEIPTS AND DISBURSEMENTS.

Of Plumas, Lassen, Sierra, and Modoc County Agricultural Association, District No. 11, *Fair, held at Greenville, Plumas County,* 1880.

Total amount of receipts, including subscription and State apportionment	$4,306 00
Total amount disbursements, including premiums, purses, and expenses	3,534 14
Balance in coin on hand	$771 86
Balance to be collected	60 00
Total balance in favor of Association	$831 86

PREMIUMS AWARDED—1880.

FIRST DEPARTMENT.

LIVE STOCK.

Class.	Name of Animal.	Name of Owner.	Address.	Premiums.
HORSES.				
Horses of all work, one year old	Washoe	D. D. Newman	Sierraville	$15 00
Horses of all work, two years old	Reno, Jr.	A. M. Worthington	Greenville	5 00
Mares, three years old	Bird	L. Hough	Greenville	15 00
Mares, two years old	Mattie	E. D. Hopelkus	Taylorsville, Plumas County	10 00
Mares, one year old	May	Wm. Cottingham	Taylorsville, Plumas County	5 00
Best sucking colt	Dock	Jo. Sheiser	Greenville	5 00
Roadster gelding, one year old	John Jackson	D. D. Newman	Sierraville, Sierra County	10 00
Roadster gelding, two years old	Jim Hasty	C. H. Lawrence	Greenville, Plumas County	5 00
Draft stallion, one year old	Pathfinder	J. H. Ulch	Taylorsville, Plumas County	10 00
Draft stallion, two years old	Rodner	B. F. Lawton	Taylorsville, Plumas County	5 00
Draft stallion, three years old	Peter	J. M. Cadle	Greenville, Plumas County	5 00
Roadster	Wm. Tell	J. H. Maxwell	Susanville, Lassen County	10 00
Roadster	Red Cloud	Sam Lee	Quincy	10 00
Roadster	John Morgan	C. P. Burney	Greenville	5 00
Roadster, two years old	Will Graham	J. W. Thompson	Quincy	10 00
Roadster, one year old	Barney	S. C. Banty	Greenville	5 00
Draft mare	Kate	J. M. Cadle	Greenville	10 00
Draft mare		N. B. Forgy	Greenville	5 00
Draft mare, two years old		E. D. Hopelkus	Taylorsville	5 00
Best brood mare	Jennie	S. E. Banty	Greenville	5 00
Best matched buggy team	Charley and May	Sam Lee	Quincy	10 00
Best mare colt		Mrs. Ellen Blood	Greenville	5 00
Best two-year old draft gelding	Mountain Chief	Jacob Moak	Prattville	5 00
SWINE.				
Poland-China boar		Isaac Hall	Greenville	$5 00
Best pen of pigs		J. M. Cadle	Greenville	2 50
Best boar of any age		Isaac Hall	Greenville	2 50
Best sow of any age		Isaac Hall	Greenville	2 50

CATTLE.				
Durham bull	Adderknight	Isaac Hall	Greenville	$15 00
Durham bull	J. C.	James Cottingham	Taylorsville	10 00
Durham bull, two years old	Sierra	Isaac Hall	Greenville	10 00
Bull calf	Garfield	Isaac Hall	Greenville	5 00
Cow	Mary Ann	Isaac Hall	Greenville	15 00
Cow	Snowflake	Isaac Hall	Greenville	5 00
Cow, two years old	Miss Banta	Isaac Hall	Greenville	5 00
Devon cow	Miss Cadle	Isaac Hall	Greenville	10 00
Jersey Alderney bull	Marin	E. D. Hopelkus	Taylorsville	15 00
TURKEYS.				
Best exhibit of turkeys		E. D. Hopelkus	Taylorsville	$5 00
Total				$292 50

SECOND DEPARTMENT.

HOUSEHOLD FABRICS.

NAME OF OWNER.	Name of Article.	Address.	Premiums.
Mrs. H. T. Formstone	Knitted bedquilt	Greenville	$1 50
Mrs. J. Beason	Display of tatting	Greenville	1 50
Mrs. Jas. Dempster	Applique work	Quincy	1 50
Mrs. J. Guire	Cotton stockings	Greenville	2 00
Mrs. J. Guire	Knitted work	Greenville	2 50
Miss Adelia Rose	Pincushion	Greenville	1 50
Miss Whiting	Bead work	Quincy	1 50
Mrs. Gould	Raised worsted embroidery	Quincy	1 50
Miss C. Knoll	Crocheted sofa pillow	Greenville	1 50
Mrs. J. S. Bransford	Gentleman's comforters	Greenville	1 50
Mrs. Hough	Made dress	Greenville	5 00
Mrs. J. E. Edwards	Embroidery	Quincy	2 50
Mrs. L. M. Evans	Worsted pillow frame	Greenville	2 50
Mrs. I. Hall	Pressed flowers	Greenville	2 00
Mrs. Kaulback	Silk braiding	Quincy	1 50
Mrs. H. T. Formstone	Display of house plants	Greenville	2 00
Mrs. A. D. McMillin	Knitted lace	Greenville	1 50
Miss Annie Treleaven	Balloon	Greenville	1 50
Mrs. J. A. Lee	Crochet tidy	Greenville	1 50
Mrs. A. D. M. Kinger	Toilet set	Greenville	1 50
Mrs. A. H. Anderson	Fancy tidy	Greenville	1 50
Mrs. F. S. Fox	Java tidy	Taylorville	1 50
Mrs. D. H. Haskins	Seamoss articles	Greenville	2 00
Mrs. I. Pronattian	Embroidered towel	Greenville	1 50
D. H. Haskins	Exhibit of soap	Greenville	2 50
Mrs. E. D. Hopelkus	Drawn rug	Taylorville	2 00
Geo. Standardt	Gold ores	Greenville	10 00
W. D. Fletcher	Gold and silver manufactures	Greenville	5 00
Mrs. L. W. Bunnell	Sofa pillow	Prattville	2 00
Mrs. W. D. Fletcher	Crochet work	Greenville	1 50
Mrs. A. D. McMillin	Lamp mat	Greenville	1 50
Mrs. F. Fox	Worsted tapestry	Taylorville	1 50
Mrs. L. C. Murry	Drawn tidy	Greenville	1 50
Mrs. Wm. Manson	Embroidered tidy	Greenville	2 00
Mrs. A. D. McMillin	Worsted wreath	Greenville	2 00
Mrs. A. D. McMillin	Wax work	Greenville	1 50
Miss Mary Thompson	Point lace	Quincy	2 00
Mrs. Proctor	Wool mats	Greenville	2 00
Miss Short	Wool mats	Greenville	2 00
Mrs. Mat. Knoll	Patchwork quilt	Greenville	2 50
Mrs. L. W. Bunnell	Rag carpet	Prattville	5 00
Mrs. J. E. Edwards	Braided mat	Quincy	2 00
Mrs. Mat. Knoll	Worsted mat	Greenville	2 00
Miss Carrie Bull	Air castle	Greenville	1 50
Miss Mamie Burge	Worsted wreath	Taylorsville	1 50
N. Flournoy	Rustic work	Taylorsville	2 00
Mrs. J. S. Ward	Drawn mat	Susanville	2 00
Miss Clara Ford	Pencil drawing	Taylorsville	2 00
Mrs. L. W. Bunnell	Knitted wool sack	Prattville	1 50
Mrs. I. Pronattain	Silk embroidery	Greenville	2 50
Mrs. E. D. Hopelkus	Homespun socks	Taylorsville	2 00
Mrs. J. A. Lee	Lace work	Greenville	1 50
Mrs. E. H. Chapins	Crocheting	Greenville	1 50
Mrs. N. D. McMillin	Hair work	Greenville	2 00
Mrs. J. Dempster	Tidy, lace work	Quincy	1 50
Miss May Ford	Pencil drawing	Greenville	1 00
	JELLIES, PRESERVES, AND PICKLES.		
Mrs. E. D. Hopelkus	Red currant jelly	Taylorsville	$2 50
Mrs. R. Thompson	Assorted jellies	Quincy	5 00
Mrs. E. D. Hopelkus	Plum jelly	Taylorsville	2 50
Mrs. E. D. Hopelkus	Crabapple jelly	Taylorsville	2 50
Mrs. L. E. Lee	Display of preserves	Greenville	5 00
Mrs. L. E. Lee	Display of pickles	Greenville	2 50

SECOND DEPARTMENT—Continued.

NAME OF OWNER.	Name of Article.	Address.	Premiums.
	BUTTER.		
Mrs. R. S. Flournoy	Ten pounds roll butter	Taylorsville	$5 00
Mrs. A. J. Hickman	Ten pounds roll butter	Greenville	2 50
Mrs. A. J. Hickman	One firkin of butter	Greenville	5 00
	BREAD.		
Mrs. I. E. Scott	Salt-rising bread	Greenville	$2 00
Mrs. R. Thompson	Domestic bread	Greenville	2 00
Miss Amie Lee	Domestic bread	Greenville	2 00
Miss Ettie Lee	Sponge cake	Greenville	2 00
	AGRICULTURAL ARTICLES.		
M. Bull	Beehive	Greenville	$2 50
	VEHICLES.		
K. McLeod	Two-seat spring wagon	Greenville	$15 00
K. McLeod	Top buggy	Greenville	10 00
	HARNESS.		
T. Fortner	Double carriage harness	Greenville	$5 00
T. Fortner	Single buggy harness	Greenville	2 50
T. Fortner	Team harness	Greenville	2 50
T. Fortner	Saddle and bridle	Greenville	2 50
	GRAIN.		
R. S. Flournoy	Sample of wheat	Taylorsville	$10 00
R. S. Flournoy	Sample of oats	Taylorsville	5 00
J. J. Hickerson	Sample of rye	Greenville	5 00
J. E. Scott	Sample of timothy seed	Greenville	5 00
	COOPERING.		
M. Bull	Beef barrel	Greenville	$2 50
M. Bull	Shakes and shingles	Greenville	1 00
	FRUITS.		
Alex. Arnold	Assorted fruits	Susanville	$3 00
Alex. Arnold	Six varieties of apples	Susanville	3 00
Alex. Arnold	Three varieties of apples	Susanville	2 00
R. S. Flournoy	Display of pears	Taylorsville	3 00
Robert Martin	Display of plums	Taylorsville	3 00
N. Stampfh	Assorted plums	Greenville	3 00
N. Stampfh	Display of apples	Greenville	3 00
N. Stampfh	Display of peaches	Greenville	3 00
H. J. Hickerson	Catawba grapes	Greenville	3 00
J. G. Maxwell	Variety of grapes	Greenville	3 00
	VEGETABLES.		
R. W. Hough	Drumhead cabbage	Greenville	$1 00
J. G. Maxwell	Cauliflower	Greenville	1 00
Isaac Hall	Early rose potatoes	Greenville	2 50
R. W. Hough	White potatoes	Greenville	2 50
T. Kelly	Variety of potatoes	Greenville	2 50
Isaac Hall	Barnwell Beauty potatoes	Greenville	2 50
J. G. Maxwell	Hubbard squash	Greenville	2 50
J. E. Edwards	Squash	Quincy	2 50
J. J. Hickerson	Pumpkin	Taylorsville	2 50
R. S. Flournoy	Red tomatoes	Taylorsville	2 50
R. S. Flournoy	Beans	Taylorsville	2 50
R. S. Flournoy	Samples of corn	Taylorsville	2 50
R. S. Flournoy	Dry apples	Taylorsville	1 00
J. G. Maxwell	Acorn squash	Quincy	1 00

REPORT

OF THE

Commissioners to Manage the Yosemite Valley

AND THH

MARIPOSA BIG TREE GROVE, 1880.

REPORT.

San Francisco, Cal., December 20th, 1880.

To his Excellency Geo. C. Perkins, *Governor of California:*

Sir: The Commissioners to manage the Yosemite Valley and the Mariposa Big Tree Grove, respectfully submit the following report:

The Commissioners appointed by you, in accordance with Senate Concurrent Resolution No. 20, adopted February 17th, 1880, viz.: J. P. Jackson, W. H. Mills, I. W. Raymond, George S. Ladd, J. L. Sperry, W. C. Priest, A. J. Meany, and M. C. Briggs, duly received and accepted their commissions, and stood ready to enter upon the discharge of their duties, from which they were prevented by the interposition of a suit, occasioned by the refusal of William Ashburner, Secretary and Treasurer of the former Board, to recognize the legality of the appointment of the new Board.

In obedience to a notification issued by your Excellency, the Commissioners met informally at "The Hall," in Yosemite Valley, July 15th, 1880, and heard and recorded statements from many of the residents concerning the condition and wants of the Valley.

On the fourteenth of August, 1880, the Supreme Court of California rendered judgment in favor of the new Board; whereupon the Executive called a meeting of the Commissioners, at No. 240, room 8, Montgomery street, San Francisco, September 27th and 28th, 1880, which was attended by all the members. After taking the oath of office, the Commissioners proceeded to organize by the election of J. P. Jackson, W. H. Mills, and I. W. Raymond, as an Executive Committee, and M. C. Briggs, Secretary and Treasurer.

As William Ashburner refused, and still refuses, to relinquish the custody of the books, papers, and funds, belonging to the Commission, we are compelled to confine our report within narrower limits, and to use more general statements than we would otherwise do.

STATEMENT OF FINANCES.

The books, and itemized vouchers in the hands of the Treasurer, show our receipts to date to have been:

From John K. Barnard for rent	$500 00
Appropriation by the Legislature	2,223 00
Total	$2,723 00

Expenditures to date :

Cash paid for clearing river	$50 00
Cash to Charles M. Leavy, for Notarial fees	9 00
Cash for books, etc., Secretary and Treasurer's office	26 75
Cash, traveling expenses to A. J. Meany	30 00
Cash to Osborn and Alexander for implements for Valley	23 70
Cash paid Publishihg Company (*Post*) for advertising	4 00
Cash for printing posters on cloth	2 00
Total	$145 45
Balance in bank to the credit of Commission	$2,577 55

LEASES AND LESSEES.

For want of the books and papers belonging to the Commission, our information concerning leases and lessees is not exact. From statements made to us, we are led to suspect that there are some occupants of State premises who hold no leases, but are acting under verbal agreements. It is our conviction that, hereafter, no person should be permitted to occupy grounds and buildings belonging to the State, without a formal lease, and that all buildings hereafter erected in the Yosemite Valley and the Mariposa Big Tree Grove grants, should belong to the State at the expiration of the leases of those who erect them.

CONDITION OF THE VALLEY.

1. Most of the available land is under lease for pasture and garden purposes.
2. The inclosed fields are being invaded by willows, wild roses, and other growth, to the damage of their value and of the beauty of the Valley.
3. The upper portion of the Valley, which has been set apart for the convenience of campers, is largely overgrown with willows and young pines. The views are obstructed, the pasturage destroyed, and the appearance injured.
4. There is no practicable and unobstructed carriage road around the Valley, near the base of the cliffs. At present all who attempt to make the circuit of the floor of the Valley, must pass through gates and fields, lose some of the finest views, and be subjected to annoyance and loss of time.
5. There are no practicable footways for ladies to the foot of the Yosemite and Illiluet Falls, nor are there seats or conveniences of any kind for the comfort and enjoyment of visitors.
6. The promenade from Black's to Barnard's is narrow and unsubstantial, and should be replaced by a broader and better, and extended as far as Liedig's at no distant day.

NEEDS OF THE VALLEY.

1. As fast as existing leases expire, new leases, if given at all, should be so drawn as to require lessees to keep the grounds clean and in good order.
2. A larger and better portion should be set apart for the use of campers, and the land now nominally subject to their use, should be properly cleared, and seeded with perennial grasses.

3. There is great need of a good road entirely around the Valley floor, as near as practicable to the cliffs. This would require a substantial bridge to be thrown across the Merced, at the highest available point above the Lamon ranch, and the building of the missing links from Harris' down the north side of the Valley, to the lower bridge. The cost would bear no comparison with the advantages.

4. Footways should be constructed to the bases of the falls, and rough but comfortable seats placed for the convenience of tourists. A way should be opened to the Illiluet Falls, which is at present entirely hidden from view, except an imperfect glimpse from a point in the road leading to Mirror Lake, and an equally unsatisfactory glimpse from Glacier Point.

5. In connection with the improvements suggested, it would be good economy to purchase a sturdy span of horses, with wagon and harness, and two dump carts, with harness, for road building, hauling gravel, clearing the river, and other necessary work.

TOLL ROADS AND TRAILS.

There are three stage roads into the Valley, one on the south, and two on the north side of the Merced. There are also three principal trails under lease, climbing the walls to main points of interest. The State made no provision for opening the grant to the public, and it was necessary to enlist private enterprise in this behalf, by conceding the privilege of collecting tolls for a stipulated time. The tolls exacted are by no means extortionate, when we take into account the cost of the improved facilities for access to the Valley, and its stupendous wonders; but they are annoying, and serve to place the State in an odious light. The total cost of the improvements alluded to cannot have been less than one hundred and sixty-five thousand dollars. Ten per cent. of all the trails, and of such parts of the roads as lie within the grant, reverts to the State every year. It is the opinion of the Commissioners that the trails, and the parts of the roads specified, ought to be owned by the State, and made perpetually free. The General Government has donated to the State a property which brings into it a million dollars per annum, and must continue to increase in fame and patronage for all time to come. It ill becomes the favored recipient of so rich a dower to haggle with tourists for tolls on every path they attempt to tread. It is the judgment of the Commissioners, after much inquiry, that all private claims of the character in question, can be extinguished with a sum not exceeding twenty-five thousand dollars.

THE MARIPOSA BIG TREE GROVE.

The Grove is continually in danger from fires, recklessly or accidentally set by sheep men and hunters. Dead limbs should be cleared away from the roots of the sequoias, and all fallen timber and rubbish burned. The trees, which are only superficially scarred, will heal rapidly, and, in a few years, present a beauty and vigor far surpassing their present appearance. Two temperate and active men should be employed at the Grove from the middle of June until the middle or last of November for the year 1881. After that one man will be sufficient. We respectfully submit whether an inexpensive building, with plain accommodations for a party of tourists, is not an improvement to be desired at this point of interest.

POLICE AND SANITARY REGULATIONS.

1. It appears to us desirable that a sober and competent Justice of the Peace should reside in the Valley, at least during the season of travel. He should be a man respectable alike in official station and in private life.

2. Owing to the remoteness of the county seat, and the transient character of the parties in interest, we renew the recommendation of our predecessors in office, that the Guardian be clothed with police authority to make arrests for violations of law.

3. It also appears to us desirable that a competent physician and surgeon should reside in the Valley, with instruments and medicines suited to the emergencies liable to arise. It would be wisdom on the part of the State to supplement the income from his practice with a moderate appropriation.

APPROPRIATIONS NEEDED.

Should it appear expedient, in the judgment of the honorable the Legislature, to extinguish private titles to roads and trails within the grant, an appropriation of twenty-five thousand dollars, say, will be needed for that purpose. To make the improvements indicated above, and much needed, an additional appropriation of twenty-five thousand dollars will be required. Such an amount is not more than five per cent. of the cash income annually brought into the State by the world-wide fame of our Yosemite's stupendous scenery; and we are convinced that it would prove a wise and remunerative outlay of public funds.

M. C. BRIGGS, Secretary.

REPORT OF THE GUARDIAN.

To the Board of Commissioners to Manage the Yosemite Valley and Mariposa Big Tree Grove:

Gentlemen: Grateful for the honor you have conferred upon me in electing me to be the Guardian of the Yosemite Valley and the Mariposa Big Tree Grove, and returning me to the scenes of so many hallowed memories, I beg leave to report, that in accordance with your instructions, I entered upon my duties October 1, 1880.

It is with more than a passing regret I have to mention, that on careful examination of the Valley, its condition forcibly convinces me that much earnest and serviceable work has to be done to redeem it from the apparent neglect into which it has fallen, and make it popular with the public.

THE UNDERBRUSH.

A dense growth of underbrush, almost from one end of the Valley to the other, not only offends the eye and shuts out its magnificent views, but monopolizes and appropriates its best land, to the exclusion of valuable forage plants and wild flowers. As much of this land is under fence (of a dilapidated and "make-shift" kind, it is true), and as some of the leases have already expired, this could soon be converted into productive fields and beautiful park-like grounds.

ROADS WITHIN THE BOUNDARY OF THE GRANT.

The roads within the boundary of the grant are exceedingly rough, and compare very unfavorably with the excellent ones over which the tourist has already traveled to reach this goal. Here let me remark, *en passant*, that an enjoyable drive over a smooth road, through such remarkably fine scenery, adds much to the zest of a ride and the charm of a visit, while inducing the visitor to prolong his stay. As a temporary measure to ameliorate this, the tops of obtrusive bowlders could be blown off, and a few loads of gravel fill in and cover up the interstices, preparatory to the proper surveying and building of a picturesque and well macadamized road from one end of the Valley to the other.

LARGE TIMBER DRIFTS IN THE MERCED RIVER.

Large drifts of timber blockaded the river, causing the high water at all times to cut away the banks, thus undermining the trees that grew upon them, and occasioning their fall. By permission of your Executive Committee, all the worst of these have been cut out, converted into cordwood, and sold, the receipts of which will nearly pay the cost of their removal.

VANDALISM AMONG GROWING TREES.

Growing trees, of great size and beauty, have been felled, contrary to law and the order of your honorable Board, yet the perpetrators of this outrage have been allowed to go unpunished. This leniency very naturally led to its repetition, and numerous stumps, still standing, attest the vandalistic acts. In a recent case I took the responsibility of confiscating a noble tree thus cut, and by public notice held the offender as guilty of trespass and misdemeanor under the laws of the State, subject to the future action of your honorable Board. I am gratified to learn that this action met with the unqualified approval of your Executive Committee.

Here please allow me to make the suggestion, that no *standing* tree whatever—whether *living* or *dead*—be allowed cut down, without written permission of the Guardian, until all the timber already down is used up. This provision, while supplying an abundance of firewood to all, will insure the removal of obstructions on the ground, and of drifts from the river, without expense to the State, while clearing both of incumbrances.

BAD CONDITION OF THE "LANE."

The "lane," so called, extending from the upper bridge to the elevated ground opposite, is utterly impassable during high water, owing to the rotting down and breaking up of the little inexpensive bridges, or drain covers, for they are nothing more, that extend across it. These need to be renewed before Spring, and the roadway graveled, this being the only thoroughfare to Mirror Lake during the overflow of the river. Here also, let me add, that the "walk," temporarily constructed of slabs, many years ago, on the eastern side of the lane, to enable tourists on foot to reach the high ground above mentioned, is now utterly rotten and useless, and being a great convenience to the public, badly needs to be rebuilt, and in a more substantial manner.

A GOOD PLANK WALK,

Extending from the lower to the upper hotel, so as to enable tourists to visit each other without walking ankle deep in dust, besides affording them the opportunity of a pleasant promenade among the grand scenes by which they are surrounded, is one of the most needed of improvements.

BRIDGES.

Although necessarily requiring considerable outlay, comparatively, four new bridges are much to be desired; one across Bridal Vail Creek, just below the falls, as when this stream is high it is absolutely dangerous, especially to small vehicles, and as this is one of the most attractive afternoon rides of the whole round, it is desirable that it should be enjoyed without jeopardy to life—especially as this bridge can be constructed at but little cost.

Another inexpensive, yet very convenient bridge, needs building over Yosemite Creek, near to the base of the lower Yosemite Fall. This would enable tourists to visit the latter, and then pass on to Mirror Lake, or vice versa, without being compelled to double on their track, as now.

Then, another bridge, across the main Merced River, at or near the old Lamon orchard, would save visitors a detour of three miles when on their way to the Vernal and Nevada Falls—trips generally taken together.

The other bridge it is desirable to build over the Merced River, just below the Bridal Vail Meadow, and, by this, complete the circuit ride of the whole Valley.

A GOOD ROAD NEEDED.

The construction of a well laid out and picturesque road, just on the outer and upper rim of the meadows, throughout the entire circumference of the Valley, would enable all lovers of the sublime and beautiful to enjoy the finest drive on earth.

UNSIGHTLY FENCES.

The abolition and demolition of all unsightly fences (this will nearly include the whole), and as soon as possible. Where it may be necessary, or desirable, to allow fences, let them be substantially constructed, and of pleasing aspect.

TOLL ROADS AND TRAILS.

Of all the most desirable things to do, in my judgment, would be the purchase by the State, and making free, all roads and trails within the boundary of the Yosemite grant. These roads and trails were built in good faith, by private enterprise, to points of great interest, that were formerly inaccessible, or accomplished only with much fatigue and physical endurance; and, as a sequence, highways to such places were—and still are—a boon to the public that cannot be lightly estimated; yet the collection of tolls thereon, although reasonable in amount, is one of the most annoying experiences of visitors, creating more complaining and dissatisfaction than any, if not of all, other causes put together. The State cannot afford to belittle itself, and bear censure from others, on account of the omission of such a comparatively small consideration as their purchase.

THE MARIPOSA GROVE OF BIG TREES.

This magnificent forest of giant forms, commanding, as it deservedly does, the admiration of every beholder, is in great danger of being irreparably injured, if not destroyed, by fire. Immense masses of rotten wood, and of fallen trees, full of pitch, lie immediately contiguous to, and, in many instances, directly against the base of these noble monarchs, inviting their destruction, should fire ever enter their impressive precincts. There can be but little doubt that no time should be lost in removing this inflammable material to a safe distance, and carefully burning it, to protect this wonderful grove from destruction.

I am aware that, to accomplish these desirable results, it will be necessary to add a limited appropriation to the rents annually derived from sundry sources at Yosemite, but to this the State will cheerfully consent, inasmuch as, apart from the just and natural pride she has in the possession and improvement of these, the most wonderful creations upon earth, the income distributed among her people by tourist travelers is such as to justify a much larger sum for such purposes, whenever it becomes desirable.

In order to enable your honorable Board, and through you the general public, to form some approximate idea of this valuable addition to our resources, I herewith append the following carefully prepared statement of tourist travel to Yosemite from 1855—the year it was first made known to the public—to 1880, inclusive:

STATEMENT OF TOURIST TRAVEL TO YOSEMITE VALLEY.

From 1855 to 1864, a period of nine years, the aggregate number was 653.

In 1864	147
In 1865 it increased to	369
In 1866 it increased to	438
In 1867 it increased to	502
In 1868 it increased to	623
In 1869 (the year the overland railroad was completed) it increased to	1,122
In 1870 it increased to	1,735
In 1871 it increased to	2,137
In 1872 it increased to	2,354
In 1873 it increased to	2,530
In 1874 it increased to	2,711
In 1875 it decreased to	2,423
In 1876 it decreased to	1,917
In 1877 it decreased to	1,392
In 1878 it decreased to	1,183
In 1879 it increased to	1,385
In 1880 it increased to	1,897
Total	25,518

As, by quiet personal inquiry, I learned that each of these, upon the average, expended a sum exceeding $600 within the State, and exclusive of railroad and steamship fares, it can be seen at a glance the importance of popularizing our public attractions, and, if possible, doubling them, so travel may increase in the same ratio.

J. M. HUTCHINGS.

REPORT

OF THE

COMMITTEE ON STATE HOSPITALS AND ASYLUMS

TO THE

Legislature of the State of California, 1881.

REPORT.

Mr. President: The Committee on State Hospitals and Asylums beg leave to submit the following report on Orphan Asylums:

Providing for the orphan and abandoned child has become a serious burden upon the State.

Apart from humanity which forbids their neglect, public policy demands their proper care, maintenance, and education. Their support in any event must be derived from the property of the people, whether obtained by a tax upon the property of all, or gathered by the voluntary contributions of individuals or associations. It is, therefore, just that the admission of children in the asylums should be guarded with proper restrictions, and the relations of the same should contribute to their support to the extent of their ability. We append three tabulated statements, exhibiting the receipts and disbursements of the various asylums for the year eighteen hundred and eighty; the movements of the children, their admissions, dismissals, increase, the number entitled, or that may be entitled, to aid from the State, those not so entitled, and the total number of all the children now therein classified respectively.

We find their receipts and disbursements, segregated in gross from their several sources of revenue and purposes for which expended, to be as follows:

RECEIPTS.

From subscribers	$7,760	00
From children's relations	16,578	80
From donations	21,772	03
From legacies	65,531	13
From receipts from fairs	15,474	98
From dividends from stocks	4,076	01
Rents	1,980	00
Farm receipts	4,753	44
Interest account	16,370	06
Pay pupils, music, and boarders	20,719	94
Miscellaneous	12,832	61
State appropriations	90,865	88
Total	$278,814	88

DISBURSEMENTS.

Postage	$61	40
Loans and legacies invested	62,230	00
Provisions	88,250	62
Clothing	36,042	01
Vegetables and fruits	6,691	76
Water	1,243	13
School books and stationery	3,599	51
Traveling and miscellaneous	15,853	93
Fuel, gas, and oil	11,863	82
Furniture	5,788	68
Bedding	2,521	96
Interest and taxes	8,293	51
Insurance	2,799	67
Repairs	15,297	08
Improvements	17,340	21
Payroll	44,287	44
Total	$322,164	76

Some of these returns are for a period of six months only, the law requiring a book of monthly accounts to be kept with proper segregations and cash balances, taking effect July 1, 1880, and are designated by a star on the tables. If, then, to the gross receipts as returned be added the amount of State aid, not embodied in the above, which has been received, a legacy of $50,000 received by St. Vincent's, of San Rafael, and approximate receipts for the six months omitted, based upon the present returns, the gross amount of receipts would about equal $373,518 88, and the disbursements, estimates for six months added, $376,120 37.

Of the gross receipts the sum of $16,578 80 was contributed by the children's relations. To exemplify the contributions from the two classes of asylums, we will denominate those under the management of the Sisters of Charity, and kindred organizations, the first class; the remainder the second class.

The first, having in their care an average of 1,597 children, received from relations $7,438—an average of $4 66 per child. The second, with 749 children, not counting the Hebrew, received from children's relatives $9,140—an average of $12 20 per child.

There are now in the asylums a total of 2,862 children. Of these 2,343 are entitled to aid at the present, and there are 222 abandoned children who may be, in the course of the year, or at least a proportion of them. If there be no further increase of children in the asylums, the number remaining as now, the State will be called upon to contribute at the rate of $177,560 per annum. If the increase of inmates continue, then the amount to be contributed for the thirty-third fiscal year may be expected to be in excess of $200,000.

Estimating the disbursements to have been made solely on account of the orphans, the per capita, deducting expenditures, for improvement and legacies invested, averages in gross $121 39; but, besides the orphans, there are children over age and boarders maintained, which swells the per capita.

Taking the San Rafael Asylum and the Ladies' Protection and Relief Society, of San Francisco, as representing the minimum of cost for 1880, we find at the former the per capita to be $108 90, and at the latter $91 50.

Deducting the gross receipts from gross expenditures as returned for the year 1880, we find, January 1, 1881, an excess of expenditures over receipts of $43,452 08 against the asylums. The amount contributed by the State in January, 1881, as its portion of aid for the last six months preceding January first, was $88,781. The asylums, therefore, have a cash balance of $45,328 92 at the commencement of the year. We do not know positively their returns cover absolutely all their expenses. There may remain a small portion unpaid; but we are satisfied if there be any, it is small.

There appears no reasonable grounds that the State, on the point of economy, would be the gainer, as has been suggested by some, to care exclusively for the orphan at its own cost; nor should it debar individuals and societies from the exercise of "sweet charity" in this regard, but rather supplement their worthy efforts. Neither should the State, inhibiting sectarian instruction in the public schools, be a party to it in the asylums.

Naturally, it would not be inferred any one would apply for admission of children in the asylums of this State other than from sheer necessity; yet the testimony of the managers does not bear out this inference in all cases, especially in the matter of abandoned children, or of parties seeking to abandon them. Neither do the parents of the children admitted in the asylums fulfill their undertakings to the same made at the time of their admission, nor do we believe they contribute to their support as they ought or might.

With regard to their management, health, condition, education, moral training of the children, etc., little remains to be added to that already to be found in the report of the State Board of Examiners. We found, in our inspection of the Protestant Asylum in San Francisco, cases of ophthalmia and tinea capitis. These were separated from the others in an infirmary, and the managers reported the cases decreasing in number. But we most emphatically recommend all asylums should not allow indiscriminate laving of the children in the same basins, nor to dry themselves upon the same towel. It is our conviction, relying upon the bounty of the State and the asylums, there is not that effort made by the parent or relatives to contribute, as is their duty, to the support of their children maintained therein We consider necessary enactments to compel contributions by the parent or relative, when able; to enforce the law relating to the abandonment of children; to invest the asylums with the legal guardianship of the children in their charge; to grant them the power to apprentice them when deemed expedient, and to protect the children so apprenticed or bound out; all of which meets with the approbation of the managements of these institutions.

Acknowledging our duty, and esteeming the privilege at its full value, of succoring the unfortunate and depressed, the question arises: How much more, as a nation, State, or individuals, are we able to endure?

Contributing hundreds of thousands for the support of our charitable institutions, to alleviate and care for the distressed, the next step should be to remove the causes, as much as possible, which entail this outlay.

R. M. LAMPSON, Chairman.

TABLE I.

Showing the Admissions and Discharges of Children in the various Orphan Asylums, 1880.

Names and Locations.	Admissions.				Discharges.			
	Orphans	Half Orphans	Abandoned Children	Total Admissions	Orphans	Half Orphans	Abandoned Children	Total Discharges
San Francisco Roman Catholic Female	34	132	22	188	22	102	12	136
St. Joseph's, San Francisco	28	113	49	190	22	101	22	145
St. Boniface, San Francisco				16				17
St. Vincent, Petaluma	2	15		17	4	3		7
St. Vincent, Santa Cruz	1	2		3	2	6		8
St. Vincent, Santa Barbara	4	6	3	13	2	9		11
San Juan Female, San Juan	3	10		13		2		2
St. Vincent, San Rafael	37	109	33	179	35	71	24	130
Grass Valley, Grass Valley	11	75	5	91	22	45	8	75
Los Angeles Female, Los Angeles	9	34		43	1	11	6	18
Pajaro Valley, Watsonville								
Sacramento Protestant, Sacramento	9	83	6	98	7	79	3	89
San Francisco Protestant, San Francisco	17	93		110	18	103		121
Good Templars, Vallejo	12	64		76	12	10		22
Ladies' Relief Society, San Francisco				152				162
Ladies' Relief Society, Oakland	1	32	20	53	4	18	18	40
Home of the Orphans, Los Angeles			20	20				
Home of Benevolence, San José			31	31				
Pacific Hebrew	9	5		14				3
San Francisco Poorhouse			43	43				
Totals	177	773	232	1,350	151	560	93	986

TABLE 2.

Showing the Number of Children January 1, 1880, *and January* 1, 1881, *their Increase during* 1880, *their Classification, and the Number of Abandoned Children receiving Aid, and those not receiving State Aid.*

Names and Locations.	1880.					1881.							
	Number of Children in Asylum January 1, as reported	Number of Children Admitted during the Year	Number of Children Discharged during the Year	Number of the Increase of Children	Number of Children entitled to State aid January 1	Number of Orphans in Asylum January 1	Number of Half Orphans in Asylum January 1	Number of Abandoned Children in Asylum January 1	Number of Children over age of fourteen in Asylum January 1	Number of Boarding Pupils in Asylum January 1	Total of all Classes in Asylum January 1	Number of Abandoned Children receiving State aid in Asylum January 1	Number of Abandoned Children not receiving aid January 1
Los Angeles Orphan Asylum, Los Angeles	70	43	12	31	101	21	70	10	28	33	162	3	7
St. Joseph's Orphan Asylum, San Francisco	326	190	145	45	292	41	187	64	16	12	320	29	35
St. Boniface Orphan Asylum, San Francisco	27	16	17	------	26	5	17	4	------	------	26	1	3
St. Vincent's Orphan Asylum, Petaluma	40	17	9	8	45	14	31	------	12	16	73	------	------
St. Vincent's Orphan Asylum, Santa Barbara	49	13	11	2	51	9	37	4	2	8	60	------	------
St. Vincent's Orphan Asylum, Santa Cruz	35	3	8	------	25	7	13	5	6	16	47	------	5
Grass Valley Orphan Asylum, Grass Valley	165	91	75	16	191	66	86	27	11	35	225	12	15
San Juan Orphan Asylum, San Juan	16	13	2	11	25	3	18	4	4	------	29	------	------
Roman Catholic Female Orphan Asylum, San Francisco	291	188	136	52	343	86	219	38	20	4	403	22	16
Pajaro Valley Orphan Asylum, Watsonville	66	------	------	------	88	------	------	------	------	------	88	------	------
St. Vincent's Orphan Asylum, San Rafael	438	179	130	49	487	138	298	49	31	------	518	22	27
San Francisco Protestant Orphan Asylum, San Francisco	227	110	121	------	212	34	178	------	------	------	212	------	1
Ladies' Relief Society Orphan Asylum, Oakland	79	53	40	13	92	3	45	44	------	------	92	20	24
Ladies' Protection and Relief Society Orphan Asylum, S. F.	216	152	162	------	206	9	82	114	------	------	206	34	80
Good Templars' Orphan Asylum, Vallejo	87	76	22	54	141	22	110	9	------	------	141	------	9
Pacific Hebrew Orphan Asylum, San Francisco	57	14	3	11	52	18	34	------	14	------	66	------	------
Sacramento Protestant Orphan Asylum, Sacramento	85	98	89	9	94	13	77	4	6	------	100	------	------
Home of Benevolence Orphan Asylum, San José	------	------	------	20	20	1	18	1	------	------	20	1	------
Orphans' Home Asylum, Los Angeles	------	------	------	31	31	5	26	------	------	------	31	------	------
San Francisco Poorhouse	------	------	------	43	43	3	23	17	------	------	43	17	------
Totals	2,274	1,256	982	395	2,565	498	1,569	394	150	124	2,862	161	222

TABLE 3.

Receipts of the various Orphan Asylums from January 1, 1880, to January 1, 1881.

NAMES AND LOCATIONS.	Subscribers.	Children's Relations.	Donations.	Legacies.	Receipts from Fairs.	Dividend from Stocks.	Rents.
San Francisco Roman Catholic Orphan Asylum, San Francisco		$1,078 00	$3,939 00	$31,475 00		$1,882 80	
Mount St. Joseph's Orphan Asylum, San Francisco		2,438 60	617 80	5,516 18		261 65	
St. Boniface Orphan Asylum, San Francisco		86 00			$181 00		$36 00
St. Vincent's Orphan Asylum (girls), Petaluma					3,129 75		
St. Vincent's Orphan Asylum (girls), Santa Cruz		406 00	952 95				
St. Vincent's (girls), Santa Barbara		117 50			403 50		
St. Vincent's (boys), San Rafael		1,413 50	5,715 55	663 25		84 25	
Los Angeles (girls), Los Angeles		134 60	162 75		1,830 85		
San Juan, San Juan		112 00			301 50		
Pajaro Valley (boys), Watsonville			722 00				571 00
Grass Valley (boys and girls), Grass Valley		1,652 00	859 00	1,125 75	4,469 70		
		$7,438 20	$13,069 05	$38,780 18	$10,316 30	$2,228 70	$607 00
Ladies' Protection and Relief Society (boys and girls), San Francisco	$632 00	$3,125 50	$1,303 06		$4,336 38		$1,200 00
Ladies' Relief Society Orphan Asylum (boys and girls), Oakland		1,045 00	520 55				
San Francisco Protestant Orphan Asylum (boys and girls), San Francisco		2,306 50	2,562 75	$25,680 00		$1,847 31	
Sacramento Orphan Asylum (boys and girls), Sacramento		803 75	77 39	70 95			33 00
Good Templars' Orphan Asylum (boys and girls), Vallejo		1,701 00	25 85				
Los Angeles Orphans' Home Asylum (boys and girls), Los Angeles		62 50	803 30		750 95		
Home of Benevolence Asylum (boys and girls), San José		96 35	206 15		71 35		
Pacific Hebrew, San Francisco	7,128 00		3,203 93	1,000 00			140 00
San Francisco Poorhouse, San Francisco							
	$7,760 00	$9,140 60	$8,702 98	$26,750 95	$5,158 68	$1,847 31	$1,373 00
Totals	$7,760 00	$16,578 80	$21,772 03	$65,531 13	$15,474 98	$4,076 01	$1,980 00

TABLE 3—Continued.

NAMES AND LOCATIONS.	Farm Receipts.	Interest Account.	Pay Pupils, Music Pupils, and Boarders.	Miscellaneous.	State Appropriations.	Total.	Average Number of Children.
San Francisco Roman Catholic Orphan Asylum, San Francisco	$6 00		$527 00	$88 20	$18,160 85	$57,155 85	344
Mount St. Joseph's Orphan Asylum, San Francisco			1,803 00	513 92	14,964 03	26,115 18	329
St. Boniface Orphan Asylum, San Francisco			6 60	60 00	480 75	*849 75	29
St. Vincent's Orphan Asylum (girls), Petaluma			570 00		756 25	4,456 00	43
St. Vincent's Orphan Asylum (girls), Santa Cruz			3,306 30	56 35	1,566 20	6,288 30	23
St. Vincent's (girls), Santa Barbara	539 60		1,399 44	36 90	929 00	*3,425 94	53
St. Vincent's (boys), San Rafael	65 25					*7,941 80	479
Los Angeles (girls), Los Angeles	408 70		4,574 87	162 67	4,779 66	12,054 10	110
San Juan, San Juan			13 33	991 26		*1,418 09	22
Pajaro Valley (boys), Watsonville	1,174 90			165 10	4,134 40	6,817 85	88
Grass Valley (boys and girls), Grass Valley			8,430 00	1,154 95	10,547 36	28,338 76	177
	$2,194 45		$20,629 94	$3,229 35	$56,368 50	$154,861 62	1,597
Ladies' Protection and Relief Society (boys and girls), San Francisco	$103 45	$815 63		$170 50	$7,017 67	$18,704 19	200
Ladies' Relief Society Orphan Asylum (boys and girls), Oakland				2,337 20	4,798 20	8,700 96	74
San Francisco Protestant Orphan Asylum (boys and girls), San Francisco		6,143 30	$90 00	189 35	17,278 86	56,098 07	223
Sacramento Orphan Asylum (boys and girls), Sacramento				659 25	1,809 89	*3,454 23	95
Good Templars' Orphan Asylum (boys and girls), Vallejo	2,437 72			5,236 82		*9,401 39	114
Los Angeles Orphans' Home Asylum (boys and girls), Los Angeles	17 82					*1,634 57	20
Home of Benevolence Asylum (boys and girls), San José		15 45		349 50		*738 75	23
Pacific Hebrew, San Francisco		9,395 68		660 64	3,592 76	25,121 01	71
San Francisco Poorhouse, San Francisco							
	$2,558 99	$16,370 06	$90 00	$9,603 26	$34,497 38	$123,853 12	820
Totals	$4,753 44	$16,370 06	$20,719 94	$12,832 61	$90,865 88	$278,714 88	2,417

* Six months disbursements.

TABLE 4.

Disbursements of the various Orphan Asylums from January 1, 1880, to January 1, 1881.

Names and Locations.	Postage.	Loans and Invested Legacies.	Provisions.	Clothing.	Vegetables and Fruits.	Water.	School Books and Stationery.	Traveling and Miscellaneous.	Fuel, Gas, and Oil.
San Francisco Roman Catholic Female Orphan Asylum, San Francisco	$21 60	$31,550 00 5,000 00	$12,567 27	$7,371 92	$1,120 49	$146 78	$264 30	$519 71 185 26	$1,670 75
Mount St. Joseph Orphan Asylum (girls and boys), San Francisco			13,521 24	5,422 76			78 40	451 75 636 30	1,071 80
St. Boniface Orphan Asylum (girls and boys), San Francisco			631 65	60 00	49 60	10 80	16 45	123 60	66 00
St. Vincent's (girls), Petaluma			1,181 36	199 60	227 19	30 00	49 75	75 00	41 00
St. Vincent's (girls), Santa Cruz	39 80		2,504 30	912 00	164 65	60 00	327 55	411 65	339 40
St. Vincent's (girls), Santa Barbara			1,546 32	293 65	95 00		77 00	235 95	18 00
St. Vincent's (boys), San Rafael			8,112 06	2,972 47	752 15		348 19	1,040 06	1,053 40
Los Angeles (girls), Los Angeles			3,699 51	1,888 77		135 00	230 19	4,627 92	369 75
San Juan (girls), San Juan			599 53	279 25	77 46	23 40	48 31		75 00
Pajaro Valley (boys), Watsonville			1,652 34	2,162 25	144 20		284 95	394 80	824 25
Grass Valley (boys and girls), Grass Valley			16,473 48	4,407 30	1,090 75	156 00	1,128 42	1,360 85	1,566 60
	$61 40	$36,550 00	$62,489 06	$25,969 97	$3,721 49	$561 98	$2,853 51	$10,062 85	$7,095 95
Ladies' Relief Society Orphan Asylum (boys and girls), San Francisco			$5,955 95	$2,748 02	$990 12	$108 00	$81 36	$824 40	$773 85
Ladies' Relief Society Orphan Asylum (boys and girls), Oakland			1,212 11	578 72		6 50	7 86	712 31	171 75
San Francisco Protestant (boys and girls), San Francisco		$25,680 00	8,754 57	4,115 01	1,639 28	381 65	263 87	1,881 37	1,874 20
Sacramento Protestant (boys and girls), Sacramento			1,299 92	534 29	137 85		24 50	117 68	446 15
Good Templars' (boys and girls), Vallejo			2,638 13	776 72		60 00	75 85	1,254 18	265 75
Los Angeles Orphans' Home (boys and girls), Los Angeles			222 10	57 47	13 84	2 00	14 21	147 80	64 00
Home of Benevolence, San José			354 75	14 85	14 00	3 00	12 60	232 86	60 00
Pacific Hebrew, San Francisco			5,324 03	1,246 96	175 18	120 00	265 75	620 45	1,112 17
San Francisco Poorhouse									
		$25,680 00	$25,761 56	$10,772 04	$2,970 27	$681 15	$746 00	$5,791 08	$4,767 87
Totals	$61 40	$62,230 00	$88,250 62	$36,042 01	$6,691 76	$1,243 13	$3,599 51	$15,853 93	$11,863 82

TABLE 4—Continued.

NAMES AND LOCATIONS.	Furniture.	Bedding.	Interest and Taxes.	Insurance.	Repairs.	Improvements.	Payroll.	Total.
San Francisco Roman Catholic Female Orphan Asylum, San Francisco	$634 77	$743 81	*$400 00 †952 70	$250 00	$849 06		$4,645 00	$68,893 43
Mount St. Joseph Orphan Asylum (girls and boys), San Francisco	847 28		176 15	125 00	699 07	455 78	2,850 90	26,336 43
St. Boniface Orphan Asylum (girls and boys), San Francisco		6 00	15 83	29 25	24 57		399 50	‡1,433 25
St. Vincent's (girls), Petaluma	25 00	83 00	60 75	31 25	40 00	3,129 39	540 00	‡5,713 29
St. Vincent's (girls), Santa Cruz	126 00	154 50	*446 32 †158 40	45 00	117 65		366 00	6,173 22
St. Vincent's (girls), Santa Barbara	24 40		*84 00 †435 14	84 00	86 50	280 50	241 00	‡3,416 96
St. Vincent's (boys), San Rafael	1,178 10	260 00	288 37		2,312 00	6,726 00	6,573 80	‡31,611 60
Los Angeles (girls), Los Angeles	213 35		689 03		292 49	640 56	936 50	13,723 07
San Juan (girls), San Juan			11 20		63 00		106 36	‡1,283 51
Pajaro Valley (boys), Watsonville		32 50	168 50		3,901 15		2,696 80	12,261 74
Grass Valley (boys and girls), Grass Valley	914 00	770 00	53 31	228 21	2,283 98	3,066 80	2,168 25	35.669 60
	$3,962 90	$2,049 81	$3,939 70	$708 71	$10,669 47	$14,298 03	$21,524 11	$206,521 10
Ladies' Relief Society Orphan Asylum (boys and girls), San Francisco	$519 16	$369 25	$1,322 70	$204 46	$918 09	$7 00	$4,380 00	$19.202 46
Ladies' Relief Society Orphan Asylum (boys and girls), Oakland	41 64	46 50	103 60	172 00	56 15	573 00	1,683 00	5,366 22
San Francisco Protestant (boys and girls), San Francisco	273 29		2,392 42	500 00	1,847 21	800 05	6,085 75	56,489 23
Sacramento Protestant (boys and girls), Sacramento	172 34			188 50	374 65		1,282 00	4,577 88
Good Templars' (boys and girls), Vallejo	205 13		5 88	288 00	157 92	701 76	2,520 08	‡8,948 03
Los Angeles Orphans' Home (boys and girls), Los Angeles	112 49	56 40	50 00		76 57		446 55	‡1,263 84
Home of Benevolence, San José	14 00		36 55	62 50		371 82	267 00	‡1,443 93
Pacific Hebrew, San Francisco	487 73		442 66	675 50	1,197 02	588 65	6,098 95	18,354 17
San Francisco Poorhouse								
	$1,825 78	$472 15	$4,353 81	$2,090 96	$4,627 61	$3,042 18	$22,763 33	$115,645 76
Totals	$5,788 68	$2,521 96	$8,293 51	$2,799 67	$15,297 08	$17,340 21	$44,287 44	$322.166 86

* Interest. † Taxes. ‡ Six months disbursements.

REPORT

OF THE

COMMITTEE ON PUBLIC BUILDINGS,

March 3d, 1881.

REPORT.

SENATE CHAMBER, SACRAMENTO, March 3, 1881.

MR. PRESIDENT: In the discharge of their duties your committee have visited and inspected the State Normal School, Deaf and Dumb and the Blind Institute, State University, and the Insane Asylums at Stockton and Napa. The condition of the Capitol and the surrounding grounds is evident to all, so that we make no particular report, further than to say that the State Capitol Commissioners seem to have taken excellent care of the property of the State. Several new buildings, for which appropriations were made last year, are now in process of erection. Of these we shall give a brief description.

EXAMINATION OF ACCOUNTS AND EXPENDITURES.

Believing an investigation of the books of the institutions supported by the State to be necessary, we have performed that duty so far as our limited time would permit. At the State University we had not such facilities of examining the books as we desired, owing to sickness of the Secretary, and absence the greater part of the time of the Assistant Secretary. Our examinations have, only to a limited degree, extended beyond the transactions of the year 1880. These accounts, so far as they have been examined by us, we found correct, with the exception of a clerical error in the accounts of the Treasurer of Napa Asylum, preceding the present incumbent, which has since been satisfactorily corrected. We were particularly pleased with the neat, concise, and comprehensive manner in which the books of the State Normal School and Deaf and Dumb and the Blind Institute were kept.

UNIFORM SYSTEM OF BOOKS.

We would suggest that a uniform system of keeping accounts be adopted and enforced in all the institutions under State control, and that they be required, in particular, to keep a book of monthly accounts, with the receipts from all sources and the disbursements entered in detail therein, segregated from the cash book under their proper heads; with the original vouchers filed away, and necessarily corresponding with the sums paid out. This book, no matter in what form the others may be kept, will be absolutely a key to all the financial transactions of any such institution. The examination then can be easily, rapidly, and thoroughly made. If, in addition, a transcript of this book, with duplicate vouchers, be forwarded to the State Board of Examiners with their reports—or oftener, if deemed necessary—the Executive will at all times have at his hand the means of thoroughly understanding their financial condition, and of reaching any cases of mismanagement that may occur, and any information relating thereto that may be required, placed at once before the Legislature.

EXAMINER OF ACCOUNTS.

We also deem it expedient that the State Board of Examiners be empowered to employ a suitable agent to make a thorough inspection of the books of all the State institutions, no such examination having been made up to this time, or the Governor to appoint a proper person to hold office as State Examiner of Accounts of all the public institutions under State control, whose duties shall be defined by the Legislature.

UNNECESSARY EXPENSE.

It often happens upon the issuing of warrants by the Controller to these institutions, that they cannot be at once cashed by the State Treasurer, and of necessity the Directors or Managers are obliged to discount them. The discount of these warrants the past year, we believe, has amounted to between three and four thousand dollars. This is a direct loss to the treasury that might be avoided if the proper legislation was had.

SUBSISTENCE OF OFFICERS.

We believe that in all cases where the State provides for the subsistence of the officers in the State institutions, the better plan would be to commute the same rather than supply them from their stores. This would give satisfaction to the officers, and give them liberty to supply their tables as they pleased, and we believe would be a matter of economy to the State.

INSURING PUBLIC BUILDINGS.

Within a few years fires have destroyed public buildings worth hundreds of thousands of dollars. The Institute for the Deaf and Dumb, and the Blind was thus lost. The State Prison at San Quentin suffered severely from fire recently, and while the Legislature was in session last year, the Normal School building was burned to the ground. The State Normal School and the Institution for the Deaf and Dumb, and the Blind, with nearly their entire contents, were consumed. Upon the Normal School building there was insurance amounting to fifty thousand dollars. This was promptly paid and furnished one third of the amount used in rebuilding. With the exception of the State University, we believe it was the only insurance carried upon buildings which are the property of the State. We think it would be well if the Trustees and Directors of the several institutions under their charge would insure them for a reasonable amount, say one half, or at least one third of their value. We would not recommend extravagant insurance, for prodigality can be displayed in this as in anything else. But we think that the experience of the past few years demonstrates the wisdom of adopting the same policy with regard to the property of the State which careful business men pursue concerning their own. Moderate insurance in reliable companies is all that we recommend. We would suggest that not more than five thousand dollars be placed with any company, so that the risk shall be divided and many companies be called upon to share the loss, should one unfortunately occur.

We make these recommendations, aware of the fact that the practice, unless wisely followed, would lead to extravagance and over-insurance, yet the losses of the State have been so great that this would be deemed a less evil than no insurance at all. The buildings of the State are isolated, and to that extent are less liable to fire. But on the other hand the uses to which they are put, and in some instances the character of their inmates, suggest that the advantages of isolation are more than overbalanced. The gentlemen who compose the directory of the several institutions are among the first and most prominent business men of our State. We have all confidence in their sagacity and ability to deal with this question. We therefore leave the matter, contenting ourselves with these suggestions in calling the matter to their attention.

THE STATE NORMAL SCHOOL.

A year ago the building occupied by the Normal School at San José was destroyed by fire. The Trustees of the school had an insurance of fifty thousand dollars upon the building, which was promptly paid by the companies issuing the policies. The Legislature, which was in session when the fire occurred, appropriated one hundred thousand dollars additional for the erection of a new building. Work was commenced as soon as plans were perfected. The old foundation was utilized as far as was practicable. The former building was of wood; the present one is of brick. It has been constructed in the most substantial manner. The style of construction is plain, yet handsome. The new building is a little larger than the old one, and much more convenient and commodious. The building will be erected, too, within the amount appropriated for that purpose. Too great praise cannot be given the Trustees for the manner in which they have administered their trust. The building is a marvel of cheapness and excellence.

The structure consists of a main or center building, the front of which is divided into four stories including basement, and the rear three stories high including basement. The center or main building is placed upon the old foundation, which is seven feet deep and five feet wide. That of the wings is new, and is of concrete three feet deep and four feet six inches wide, with four feet of brick on top. The ground line or top of foundation, ashlar or base course, is two feet four inches high and ten inches thick of plain sandstone. The entire building has a frontage of two hundred and thirty-six feet and the center building a depth of one hundred and seventy-five feet. The approaches to the new edifice are from the west, consequently facing on Fourth street, whilst the rear faces on Seventh street. Upon the main building, above the roof, is placed a tower of wood, having four openings, and four places for clock-dials; this tower is about twenty-five feet square and fifty-six feet high. From the ground to the top of tower it is about one hundred and thirty-four feet. With the exception of a belting course of sandstone running around the entire building at each story—plain sandstone sills and lintels for windows, the three main entrances consisting of platforms and steps of granite, with caps and trimmings of sandstone, porches, cornices, and roof—the entire outer building is of brick; the roof is of redwood, covered with tin.

The walls of the main building in the basement and first or main floor are twenty-one inches thick, in the second story they are eighteen inches, with a brick pier between each window two feet wide and three inches thick, making the walls at these points twenty-one inches thick ; there is also studding, two by six inches, strapped to the walls by iron straps. The walls of the third story, main front building, are eighteen inches thick; the wing walls are eighteen inches thick, being of uniform thickness throughout. In the attic of each wing is a water tank, having proper connections for supplying the building with water. Each of these tanks has a capacity of four thousand five hundred gallons. The partitions throughout the building are of redwood, two by eight inches, placed sixteen inches from centers, except under the tower and water tanks, where they are eight inches from centers, and are all well bridged. The building is lighted throughout by windows of two lights each, glazed with twenty-six ounce crystal sheet glass, except in the play-rooms and water-closets, which are of corrugated glass. The floor joists in the basement are of redwood, two by twelve inches; in the balance of the building they are of Oregon pine, two by sixteen inches; the flooring is also of Oregon pine, one and one quarter by three and one half inches, and is deadened with tanbark and mortar three inches deep. The building is to be finished throughout with three coats of plastering, and is now nearly completed. There is a complete electric alarm system throughout the building, connected with the main office and janitor's room. The gas fitting is completed, and the plumbing nearly so. The sewer system is complete; is of ironstone pipe, and connects with Fourth street sewer. There are three boilers, of the Harvey system, with proper connections for heating and ventilating the building. The wooden cornice on outside of the building is to be sanded, to conform with the stone work. The three main entrances to the building will consist of platforms and steps of granite, with caps and trimmings of sandstone. The porches are of wood; in size, one of forty by twelve feet, and the other two, thirty by twelve feet. Basement doors are of redwood, three feet six inches by seven feet; all the other doors are three feet six inches by eight feet, of sugar pine, one and three-quarter inches thick, with raised moldings. The finishing above the basement throughout the building is to be of white cedar, varnished; that of the basement painted in imitation of the above. All of the class rooms are to have cement blackboards made in the walls.

In the basement there are five rooms for the use of the janitor; the plastering in these rooms is finished, the wooden finish nearly so; in the heating room in the north wing, besides a boiler for heating this wing, is a steam pump for furnishing water for the building, and is all complete; a spare room for storage, and adjoining is a wood room, also two rooms, ten by twenty-five feet, for water-closet purposes, now nearly completed; in the south wing is a heating room for that wing, spare room, wood room, and laboratory, the plastering in the latter is finished; in the basement of the main building are four rooms, two will be used for lunch rooms, two for play rooms; the floors are laid in these rooms, otherwise they are unfinished; there is a corridor extending through the basement north and south, east and west, twelve feet wide; height of the basement is six feet and eight inches in the clear. Leading from the basement to the first or main floor are four flights of stairs; this floor contains twenty-seven rooms, also corridors running north and south, east and west, the entire length of the building, same as in the basement; eleven of these rooms and one cloak room are for the training department; four class rooms, with teachers' closets attached for reference books, etc.; two rooms for natural philosophy, two for chemistry and optics, one library, one reception room, one office, one preceptress, one private, and two cloak rooms. All the flooring is now laid on this floor except a piece twelve by thirty feet; leading from this floor to the second story are six flights of stairs; on this floor there are fifteen rooms, consisting of ten class rooms, having teachers' closets attached; one assembly hall sixty-five by ninety-five feet; this hall is twenty-two feet high; four cloak rooms, two of which contain water-closets; floors all laid in this story except that in the assembly hall; there are two stairways leading from this floor to the third story in the front part of the building; this floor is about sixty-five feet square, containing a museum and corridor; the ceiling is sixteen feet high; one flight of stairs lead from this floor to the tower.

The grounds are entirely unimproved, being in the same condition as at the time of the fire, but early in the session this committee recommended the passage of the bill then pending, appropriating twenty-five thousand dollars for the improvement of the grounds surrounding the building. These grounds comprise six blocks with the included streets. This property, the largest and most elegant of San Jose's parks, was given to the State when the Normal School was first located in that city. It has been too long neglected. This bill passed without amendment and has been approved by the Governor. We congratulate the Senate that at last the grounds surrounding one of the chief educational institutions of the State will be put into proper condition.

STATEMENT

Showing amount paid, amount due, and total cost of Normal School building to January 31, 1881.

For What Purpose.	Paid.	Due.	Total Cost.
Carpenters	$16,094 26		$16,094 26
Plasterers and lathers	2,935 30		2,935 30
Brickmasons	8,313 45		8,313 45
Painters	152 45		152 45
General labor	12,253 52		12,253 52
Salaries	5,750 00		5,750 00
Lumber	12,377 97	$24 87	12,402 84
Brick, lime, sand, etc.	13,568 95	531 65	14,100 60
Hardware	1,541 46	909 58	2,451 04
Paints, etc.	1,676 28	318 46	1,994 74
Mill work	12,247 67	2,347 20	14,594 87
Stone-belting and steps	7,301 95	3,600 00	10,901 95
Blacksmithing	213 17	23 95	237 12
Iron	868 49	4 70	873 19
Plumbing and gas fitting	1,801 05	800 00	2,601 05
Tinning	2,700 00	567 30	3,267 30
Heating	2,666 66	5,333 34	8,000 00
Stairs	600 00	1,044 67	1,644 67
Glass	2,125 00		2,125 00
Electric apparatus	150 00	235 00	385 00
Miscellaneous material	1,513 88	26 00	1,539 88
Expenses	1,449 05		1,449 05
Totals	$108,300 56	$15,766 72	$124,067 28

Estimates have been made which show that the building, when completed, will come within the appropriation.

BACON ART AND LIBRARY BUILDING.

In the year 1878, Mr. Henry Douglass Bacon, of Oakland, gave to the State University his valuable collection of works of art, sculpture, and paintings, and a library of several thousand volumes of standard and miscellaneous works, together with twenty-five thousand dollars in money, provided the State would appropriate a like sum to be used conjointly in erecting the first subdivision of the building to be dedicated to the purpose of a repository for a vast library, and galleries for the exhibition of the æsthetic arts.

The Legislature, in its session of the Winter of that year, appropriated twenty-five thousand dollars to fulfill the conditions in the bequest of Mr. Bacon, and as a result the building of this edifice was commenced on June 20th, 1880, and is now ready for acceptance of the Board of Regents.

DESCRIPTION OF THE BACON ART AND LIBRARY BUILDING,

By John A. Remer, Architect.

The building is located nearly in the center of a quadrangle formed by the College of Letters, the Agricultural College, the Mechanic Arts College, and the sight for a proposed new building, on an elevated and rising plateau of ground, which extends its gradual ascent from the line of the Agricultural College and College of Letters up to the Mechanic Arts building.

The approaches to the new edifice are from the west, the front consequently facing the north and south halls; whilst the Mechanic Arts building looking upon the rear has probably the finest perspective view of its principal features.

The structure, strictly speaking, is divided into two almost separate buildings; the front, rectangular in form, containing the reading rooms, committee rooms, and book storerooms, together with the art gallery, has a frontage of eighty-seven feet six inches by a depth of thirty-eight feet. To the rear of this are the two main entrances and lobbies of the building, extending outward as wings some twenty feet each side, having a uniform depth of twelve feet six inches.

To the rear of the front or rectangular portion extends the library or book room, a rotunda sixty-nine feet in diameter, with a depth of fifty-four feet, and a height to the lantern inside, of fifty-seven feet.

The front building is divided into three stories; the basement or ground floor containing two rooms for consultation and general work, rooms for book storage, and the common passage to the several apartments. The cellerage under the library is devoted to coal and boiler rooms; whilst the basements of the entrances or wings are arranged as toilet rooms, having water-closets, urinals, and wash basins for the general use of the house, two circular flights of steps descending from the main lobbies, affording accommodation for the upper stories in the use of the same. These internal arrangements are connected with the upper floor by a main staircase, four feet eight inches wide, which connects the library and work-rooms direct.

The first or principal floor contains three reading rooms, connecting with the library proper; the two wing entrances with the lobbies and vestibules, and the first floor of the library. Opening from the vestibule of one of the entrances is the principal staircase to the art gallery, so arranged that access to the gallery can be had without entering or interfering with the library or any of its departments.

In the lobbies are placed drinking fonts for the use of guests and students.

The second floor, or third story of the front building, contains the art gallery, which occupies the entire floor.

A double door, six feet wide, opens from the art gallery center room out upon a balcony into the library, and from which a complete view of the rotunda, with its galleries and dome, can be obtained.

Above the central gallery, and in the main tower of the front façade, is located a room devoted to art curiosities and antique collections. This department is reached by a continuation of the main staircase, which enters the tower from the art floor below. Adjoining this center tower room is the tank room in which is placed the tank of nine hundred gallons capacity for supplying the waterworks in the basement, and feeding the hot water boiler.

All the interior finish of the building is of modern gothic, the principal rooms, staircases, and art gallery being wainscoted with heavy paneled wainscoting, finished in the natural wood. An elevator, with a lifting power of two tons, runs from the basement floor to the art gallery, serving to convey books, pictures, statuary, and art collections to the stories above. The building is heated by the most improved hot water system, the boilers being located in the cellar under the library.

The general design of the exterior is modern gothic, the main façade being divided into two wing faces extending beyond the main body, and a central projection, terminating in a tower, which rises to a height of one hundred and two feet above the ground. The height of the main body, as also the main deck of the rotunda roof, is fifty-seven feet, the lantern of dome rising some nineteen feet still higher, and capped with a crown cresting of iron.

The roofs are of slate; the decks tinned. All cornices, ornaments, pediments, finials, etc., connected with the roof, are of heavy galvanized iron, and all skylights built of the same, no materials of an inflammable nature being used on the exterior of the building. The frontage is provided with two niches for statuary, and an iron balcony and portico extending around the base of the tower. The principal entrances are reached by flights of granite steps, which extend in three different directions, having double platforms, and fancy paneled and molded granite newell posts, topped with gas standards.

Statement of amounts paid upon Contracts, etc., of the Bacon Library and Art Gallery at Berkeley, to February 23, 1881.

Cash paid R. Mitchell, contractor	$38,906 50
Cash paid J. A. Remer, architect (commission)	1,600 00
Cash paid Robert McKellican, Superintendent (salary)	1,400 00
Cash paid for advertising for plans	67 10
Cash paid for advertising notices to contractors	179 00
Cash paid for advertising proposals	211 50
Cash paid for printing specifications	18 00
Cash paid for two block marble slabs	90 00
Total payments to February 23, 1881	$42,472 10

NAPA INSANE ASYLUM.

At the last session of the Legislature an appropriation of twenty thousand dollars was made for the improvement of buildings for use of insane at the Branch Asylum at Napa. This sum has been expended to date as follows:

To building material	$6,239 23
To labor	6,833 00
To furnishing	3,817 90
To interest and exchange for warrants discounted	450 66
To balance in hands of Treasurer February 12, 1881	2,659 21
	$20,000 00

The following improvements were made with the above expenditures. The first ward is finished and is on the second floor, just back of the amusement hall, in the main building. It contains one room for a seamstress, one room for two attendants, one dormitory, and three smaller rooms for patients, one sitting room, bath room, Matron's business room, sewing room, mending room, clothes room, dining room, tailor shop, and several closets. This ward accommodates twenty-nine patients, is furnished with that number of bedsteads, with mattresses and bedding, besides those for the seamstress, tailor, and attendants. The dining room is furnished, and guards, or gratings, put up at each window, and around the stoves. The next ward finished is No. 3, in the laundry building. It is on two floors. The lower floor contains a dining room, sitting room, and five bedrooms. The second floor contains three dormitories, with accommodations for twenty patients in each, an attendant's room, two small rooms for patients, clothes rooms, closets, etc. This ward is also completely furnished.

Ward No. 2 is over Ward No. 1, in rear of the center building, and over the kitchen and storeroom. It is not yet finished, but will consist of one large dormitory, three small rooms for patients, wash room, bath room, closets, sitting room, attendant's room, clothes room, and dining room, and will, when finished, accommodate fifty patients. There is now money enough on hand to finish this ward, but none to furnish it. The work is all well done.

Many of the older rooms require painting and kalsomining, also a strengthening of the window guards. In the freestone copings, over the windows, and at the ends of the corridors, the water soaks through during the Winter, discoloring the walls. This should receive attention. We believe the painting of these copings would remedy the evil. By the transcript of the Treasurer's book is an item for interest and discount of four hundred and fifty dollars and sixty-six cents. This is caused by the issuance of warrants on a fund which has no money to its credit, and the Board of Trustees are consequently obliged to have them discounted.

STOCKTON INSANE ASYLUM.

We find that considerable painting has been done, both inside and outside of the building containing the female wards; otherwise there seems no change. The new building for which the last Legislature made an appropriation of eighty-five thousand dollars was commenced on the 24th day of January of this year, and but part of the foundation had been laid at the time of our visit, and no money had been expended from the appropriation. It is expected to finish the building next October. When this building is completed it will do away, in a great measure, with the necessity of using the second and tenth wards, which are totally unfit for human beings, even though they be insane. These wards have been a shame and a disgrace to the State, and have been reported as such so often that it is unnecessary for further comment here. From the appropriation of five thousand dollars for graveling purposes made at the last session of the Legislature, two thousand two hundred and eighty-eight dollars and twenty-five cents has already been used, with good results.

The buildings erected by the Directors of the Institution for the education of the Deaf and Dumb and the Blind, from the moneys appropriated by the Legislature at the session of 1880, are:

First—A refectory.

Second—A girls' home.

A brick foundation also has been placed under the shop building. The refectory is finished and has been occupied several months; it is the central building of the group, being ninety feet from any other, shaped like a T, having a frontage of seventy-two feet with a total depth of one hundred and thirty feet. A portion of it is two stories in height and contains all the offices connected with the culinary department. The main dining-room is seventy-two by forty-two feet, with an arched ceiling finished in white cedar. There are officers' dining-rooms, pantries, storerooms, quarters for the female servants, together with a kitchen, meat rooms, servants' dining-room and apartments for the male servants.

The Girls' Home is constructed of brick; it is in dimensions fifty by one hundred and fifty feet. The foundation is of stone, with granite quoins, mullions, water-table, and sills. The subfoundation is of Portland cement concrete five and a half feet wide by one and a half feet thick. The staircases are all of granite, with a fire escape of the same material. The roof is of slate. The basement contains play-rooms, coal, trunk, and bath rooms, and water-closets for day use. The first floor has sitting rooms, matron's room, music room and lavatories. The second floor has a teacher's room, convalescent room, dormitories, and lavatories. The third floor has dormitories and lavatories. The finish throughout is of white cedar; the architecture plain, but constructed in a solid and substantial manner. There is not a wooden partition in the building; the walls are constructed hollow to prevent dampness, and the plastering laid upon them with neither furring nor lathing.

The appropriation for the shop building was expended in making a substantial foundation to that structure, in erecting a brick water-closet for the same, painting the entire building, and relaying the drains.

CONDITION OF BUILDING FUND.

To cash paid pay roll	$16,508 35
To cash paid bricks	7,479 20
To cash paid cement	1,778 50
To cash paid freight and hauling	261 77
To cash paid galvanized iron work	1,000 00
To cash paid iron work	3,004 97
To cash paid granite	9,994 00
To cash paid hair, lime, and plaster	1,334 70
To cash paid lumber and mill work	8,770 24
To cash paid nails and hardware	959 71
To cash paid plumbing materials	1,134 22
To cash paid paints, oils, and painting	1,264 79
To cash paid sand and gravel	1,226 43
To cash paid slate	924 00
To cash paid sewer pipe	76 68
To cash paid blacksmithing	27 10
To cash paid plastering	1,167 85
To cash paid tiles	7 50
To cash paid grading	119 53
To cash paid glass	897 30
To cash paid architect's fees	2,500 00
Total	$60,436 84
Amount due on contracts for mantels	$425 00
Amount due on contracts for granite	538 80
Amount due on contracts for mill work	1,250 00
Amount due on contracts for galvanized iron work	1,301 00
Amount due on contracts for painting	973 00
Amount due on contracts for glass	314 00
Amount due on contracts for architect's fees	750 00
Amount due on contracts for plastering	379 00
Total	$66,367 64
Appropriation	$68,000 00
Leaving a balance, February 1, 1881	$1,632 36

CONCLUSION.

Your committee, in conclusion, desire to return their thanks to the officers of the respective institutions visited by us, for their courteous treatment, and their uniform politeness and attention. They made our visits pleasant, and in every way aided us in the discharge of our laborious duties.

All of which is respectfully submitted.

BAKER, Chairman, for Committee.

REPORT

OF THE

Assembly Committee on Prisons.

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REPORT.

To the honorable Assembly of the State of California:

The following is respectfully submitted to your honorable body as the result of our investigation of the affairs of the State Prisons of this State, with some reflections on the principles of prison discipline and management adopted by the various Penitentiary Congresses, and in practice in some of the best penal and reformatory institutions of Europe and the United States:

The Constitution interdicting contract labor, which has heretofore been general, necessitates the purchase at once of machinery, utensils, and material—an entire outfit for the employment of at least fourteen hundred convicts, besides those engaged as helpers about the institutions. The prison authorities are now working vigorously to meet the exigency.

At San Quentin there are fourteen hundred and fifty prisoners. Of this great number not over three hundred are employed at present, except as helpers about the institution. In the Summer months about two hundred may be employed in the brickyard belonging to the State. The jute establishment, provided, with great foresight, by the State Prison Directors, will probably employ five hundred more. This leaves seven hundred and fifty more out of employment, less probably one hundred who may be employed in the kitchen, laundry, and other departments connected with the prison.

The Board of Prison Directors are gentlemen of intelligence, integrity, and well established business character, and they will probably be able, by the introduction of additional industries, to give every man employment, and make this institution self-supporting, as soon as their system of labor is well organized.

The Superintendent and associate officers of this institution, without the training and experience of officers of older countries and more ancient institutions, have done much to root out vicious practices of long standing, and to establish order in this institution.

When we visited the prison, the prisoners expressed the most kindly feelings toward their officers, and no complaints of cruelty or injustice were made, though ample opportunity was afforded.

Much to the credit of the present officers, and in evidence of their efficiency, was the universal expression among the prisoners that their condition was much improved by the present administration. Many of the cells should be improved and made more cheerful for their unfortunate occupants.

The mistake here was made in the beginning. This institution was built without any well ordered plan or system of classification in aid of the great work committed to its officers—the moral improvement and restoration of those committed to their charge.

THE FOLSOM PRISON

Is now in its infancy. There are about three hundred prisoners confined there. They are at present employed in completing the building, in constructing sewers, and in grading the prison grounds.

Granite is the staple here. The supply of excellent granite is unlimited. A thousand men might be employed an unlimited length of time in quarrying in the mountain of granite connected with this institution, and in reducing the material to blocks cut, finished, and ready for use.

The State can here, without price, obtain the material for its public buildings, and for adorning its public parks and grounds. The granite blocks can be prepared and finished here to fill any order, either from the State or its citizens. The quarry can, if properly worked and managed, be made a source of revenue to the State and of general utility to the people.

SAN QUENTIN.

There are at present at San Quentin fourteen hundred and fifty convicts. Before any were transported to Folsom there were fifteen hundred and fifteen. The cost of maintaining this institution for the last fiscal year, ending the first day of July, 1880, was two hundred and fifty-five thousand three hundred and eighty-seven dollars and eighty-one cents. Of this last, one hundred and eighty thousand dollars was for subsistence and salaries. The remainder was for prison improvements. There has just been appropriated for the purpose of the purchase of jute, jute machinery, brick land, prison machinery, and material, two hundred and nineteen thousand dollars.

From this statement, omitting jails and police stations, some idea may be formed of the volume of crime in this State, and the magnitude of its demand upon the resources and revenues of the people.

OBJECTIONS TO THE CONTRACT SYSTEM.

Cost of Crime in the United States.

It has become the settled constitutional policy of this State to abandon entirely the contract system in our prisons, and work the prisoners on account of the State.

State Account.

The State should carry on its own prison industries, so that it can supply continuous work; so that it can establish such industries as are least in competition with the established industries in the State; so that it can establish such manufactories as are most useful and profitable, both to the State and its wards; so that the pernicious influence of the contract system, distracting and destructive to discipline, may be avoided; so that the State may work its wards continuously, faithfully, and profitably, and impart habits of frugality, economy, and industry to its unfortunate members.

Buildings and Workshops.

To accomplish these beneficial purposes it is necessary that the State should provide suitable well-arranged buildings, including workshops, grounds, machinery, and tools, on a scale of magnitude corresponding with its workers. The State can no more work without machinery and tools than the mechanic, the artisan, or the farmer.

The State now has to purchase and have machinery and tools and workshops on a gigantic scale. She has an immense operating force, and it must all be employed steadily and profitably. She must also have a large number of well appointed guards, foremen, and officers.

Sixteen Millions

Is the approximated cost of the forty-five State Prisons in the United States. The cost of the jails, penitentiaries, and reformatories in the United States is supposed to be much greater.

The number of officers and employés in the forty-five prisons is about fifteen hundred. The aggregate annual salaries paid them amount to one million fifteen thousand dollars. The total annual cost of the State Prisons for ordinary current expenses, including salaries of officials, amounts to about three million dollars. The aggregate annual earnings from all of these prisons amounts to about one million five hundred thousand dollars.

I insert the following interesting and startling statement of the history and progress of pauperism and crime, taken from the Montreal Weekly Witness:

The Increased Cost of Maintaining Criminals and Paupers.

"The rapidly augmenting cost of caring for the indigent and criminal classes in the United States, is causing some degree of alarm among political economists, for should the annual increase in the cost of supporting these classes continue for thirty years to come, in the same ratio as in the past thirty years, it will exceed the cost of maintaining the army and navy. In 1850, with a population of twenty-three million one hundred and ninety-one thousand eight hundred and seventy-six, it cost yearly two million nine hundred and fifty-four thousand eight hundred and six dollars public funds to support the poor and criminal classes. In 1860 the population had increased to thirty-one million four hundred and forty-three thousand three hundred and twenty-one, but the annual cost of maintaining the parasitic population had increased to five million four hundred and forty-five thousand one hundred and forty-three dollars, which sum had increased to ten million nine hundred and thirty thousand four hundred and twenty-nine dollars in 1870, while the whole population numbered thirty-eight million five hundred and fifty-eight thousand three hundred and seventy-four souls. It is now estimated that when the census tables are computed for 1880, the annual expenses incurred in maintaining these classes will amount to twenty million dollars, or forty cents per head of the entire population, while in 1850 the annual cost was but twelve and a half cents to each inhabitant. The population has been doubled in the past thirty years, but the cost of supporting the wicked and infirm portion of it, has increased nearly sevenfold. The immense extent of unoccupied fertile lands in the Western States has hitherto acted as a kind of safety-valve, to draw away and absorb large numbers of persons who would otherwise have become burdensome to the public, either as paupers or criminals. It is probable that within ten or a dozen years all the valuable agricultural lands will have passed out of the possession of the Government of the United States, and no more free homesteads will remain to tempt people from a life of vice or indolence. When this takes place there will probably be a greater ratio in the increase in these classes than in the past thirty years, so that in thirty years more, or in 1910, their support will cost one hundred and forty million dollars annually, or about one dollar and twenty-five cents for each head of population within the territory of the United States at that time."

Cost of Criminal Trials.

And this estimate omits the enormous cost of arrest and criminal trials engaging the time and attention of Judges, prosecuting officers, juries, Sheriffs, and other executive and judicial officers who administer criminal law in some of its forms or processes.

PRISON LABORS AND PROFITS.

As a rule everywhere, in all of the useful departments of labor, profit is a reward thereof.

The more rightly directed work, the greater the production, and the greater the production, the greater the comforts, prosperity, and wealth of any individual or community or commonwealth.

Good men are compelled to work to support themselves, their families, society, and the State.

The fact that a man has violated the law, has become bad, is not a reason why he should be excused from the force of that law, that universal command, that by the sweat of the brow bread should be earned. The fact that one has become a criminal is not a good reason that others should labor to support him in idleness. As a matter of justice to the law abiding, as a matter of utility to the State and to the convict himself, he should be practiced in profitable manual labor.

By the efficient management of at least twenty of the largest prisons and reformatories in the United States they are now self supporting.

Mr. Z. R. Brockaway, a pupil of Gen. Amos Pilsbury, of Albany, New York, organized and for ten years superintended the House of Correction at Detroit, with an average of four hundred prisoners, with mean sentences of one hundred days, and by prison labor paid its current expenses and realized a profit of one hundred thousand dollars, which was paid into the city treasury.

The late Gen. Amos Pilsbury, in about forty years service at the Weathersfield Prison, Connecticut, and the Albany Penitentiary, paid their current expenses and saved a surplus for the institutions of three hundred thousand dollars. With profitable labor there was order and discipline. The French Prison Commissioners, Messrs. de Beaument and de Toqueville, specially commended his management, and pronounced his system, discipline, and order admirable and unsurpassed on this continent.

Mr. Louis D. Pilsbury.

Mr. Wines, in his admirable and comprehensive treatise on prisons and reformatories, published in 1880, writing of Gen. Pilsbury's son, Louis D. Pilsbury, Inspector of Prisons for the State of New York, who was trained with Mr. Brockaway in the Pilsbury school, and seems to have inherited the great abilities of his ancestors, says in regard to the government of prisons in the State of New York: "A change of system has been effected, and two years of the administration of Mr. Louis D. Pilsbury has wrought marvels in the industries and finances of the State Prisons for men, averaging in the aggregate some thirty-six hundred inmates. From being an annual charge upon the State treasury of nearly or quite a half million of dollars, they are to-day, from the labor of the convicts, beside paying every dollar of current expenses, turning a considerable revenue of hard cash into the public treasury." In the meantime the welfare of the prisoners has not been overlooked. There has been no deterioration in the quality or quantity of food and clothing provided.

Idleness and its Effects

Have well been described by an English poet:

See the issue of your sloth.
Of sloth comes pleasure, of pleasure comes riot;
Of riot comes disease, of disease comes spending;
Of spending comes want, of want comes theft,
And of theft comes hanging.

Steady action and useful employment is the basis of sound discipline, and at once both the means and the proof of reformation. The want of employment is a permanent and potent occasion of crime. The great philanthropist, Howard, said: "Make men diligent and they will be honest."

Sir Frederick Hill, the distinguished Governor of Scottish Prisons, said: "I have ever held useful, industrious, and productive work as the very life of a good prison. And this not alone because such work is in accordance with the common behests of our humanity, but because, among other benefits, it affords one of the surest means of moral training. It accustoms the convict to labor, creates respect for it, and, on liberation, they are prepared to earn a living, and fewer return to crime."

Howard, when on one of his travels of mercy, discovered a prison in Rome, for boys and young men, with this inscription:

"Pope Clement XI.

"For the correction and instruction of the profligate youth, that they who, when idle, were injurious, may, when instructed, be useful to the State. 1704."

At this institution various handicrafts were taught; such as printing, book-binding, designing, smithery, shoemaking, weaving, dyeing, etc.

The poet Cowper describes the evidences and results of idleness as follows:

The languid eye, the cheek
Deserted of its bloom; the flaccid, shrunk,
And withered muscle, and the vapid soul.

Again:

Absence of occupation is not rest;
A mind quite vacant is a mind distressed.

PREVENTION OF CRIME.

A moral care and to some extent guardianship on the part of the State and society over the ignorant and tempted, is a primary duty. It is also one of the highest duties to prevent crime. That is a poor type of statesmanship, scarcely deserving the name, that looks only to results, disregarding the producing causes. It is necessary to penetrate the haunts and nests and nurseries of crime to discover its origin, and if possible, to destroy mischief in its birth and breeding places, especially in great cities. Doctor Channing says: "What I want is not merely that society should protect itself against crime, but that it should do all it can to protect its exposed members *from* crime, and do so for their sake as truly as for its own. It ought not to breed monsters in its bosom. If it will not use its prosperity to save the ignorant and poor from the blackest vice, then it must suffer and deserves to suffer from crime. If the child be left to grow up in utter ignorance of its Maker, of its relations to society, to grow up in an atmosphere of profaneness and intemperance, and in the practice of falsehood and fraud, let not community complain of its crime. If it has quietly looked on and seen him year after year arming himself against its order and peace, who is the most to blame when at last he deals the guilty blow?"

The Object of Reformatories

Is by a course of treatment, instruction, and discipline to eradicate the desire and the habits of evil; to train the subject in the ways of virtuous industry; to sunder the tie that binds the erring youth to his associates in vice, and to create in his mind an honorable and useful ambition in the affairs of life.

Punishment is the instrument—prevention the object. There is no protection against crime without preventing it. The art or science of prevention must occupy the foreground. This widens the scope of a prison system, embracing the course of crime and the classes from which criminals come, as well as their treatment.

The Government Should Interpose Barriers.

The influence of society at large, and of the Government, must be enlisted in aid of efforts to interpose barriers to the growth of crime, restraining practices and habits premonitory of certain results, and preventing so far as is possible the crop of criminals now gathered as a harvest with every returning session of the criminal Courts.

SYMPATHY FOR OFFENDERS.

Some begin life with inherited passions and propensities apparently ungovernable and uncontrollable.

The power to withstand temptation is weakened if not destroyed in others by the indulgence of the appetite or by a vicious course of life. With an enfeebled conscience and oft vanquished resolution the passions and appetite gain the mastery, and the victim is led, as by some demon, down the rough road of crime to perdition.

It has been ascertained that of one hundred thousand criminals the misfortunes of eighty thousand were traceable to intemperance on their part, or on the part of their parents.

Mr. Brockaway, the distinguished philanthropist and prison Governor says: "The forlorn wretch, who is often the victim of ancestral vices, vile parentage, and poverty stricken surroundings in early life, is an object of sincere pity."

A person under sentence for assault recently said in the presence of the writer (and I believe truly), that the unfortunate act that brought him to prison was committed without reflection, on the impulse of the moment, like jumping off a car in motion at the cry of danger.

Sir Walter Crofton considers that crime is the result of moral obliquity, varying in intensity from a slight weakness to an utter destruction of the moral faculties, and that a penitentiary should be a moral sanitarium.

Dr. Channing says that "Society has hitherto employed its chief energies to punish crime. It is infinitely more important to prevent it, and this I say, not for the sake alone of those upon whom the criminal preys; I do not think only or chiefly of those who suffer from crime, I plead also and plead more for those who perpetrate it. In moments of clear, calm thought I feel more for the wrongdoer than for him who is wronged. In a case of theft incomparably the most wretched man is he who steals, not he who is robbed. The innocent are not *undone* by acts of violence or fraud which they suffer. They are innocent though injured. They do not bear the brand of infamous crime, and no language can express the import of this distinction."

CRIME A DISEASE.

Morally considered the criminal is a man in part like other men, in part different. In the person who steals two things are observed, the thief and the man; these cannot be separated and ought not to be confounded. The thief constitutes the diseased part of his being and the man the sound part. There are no two men perfectly alike. The malady may be the same in both, but the resources found in their organism, or their capacity to vanquish it, will vary greatly, and the difficulties in the way of reëstablishing the moral health of each will differ in the same proportion.

Peculium, or Share of Earnings.

The policy of exciting interest and stimulating the prisoner to industry by granting him some share of his earnings, or by pecuniary reward, is generally admitted and practiced in some manner among most civilized nations.

In France prisoners receive the following proportions of the proceeds of their labor: Those awaiting trial, seven tenths; those sentenced to imprisonment, five tenths; to detention, five tenths; to seclusion, four tenths; to hard labor, three tenths. One half of the peculium may be used for good purposes during confinement, and the remainder after the discharge.

Doctor Despine says that prisoners should be stimulated to good conduct by rolls of honor, by good marks, by premiums, even, which should be distributed to them with a certain solemnity, in order to strike their imagination. In Austria, and even in Japan, the prisoner has a share of his earnings."

Sir Frederick Hill adopted this rule, that all of the prisoner's earnings above an allotted task should be placed to the prisoner's credit. to be employed by him under control, either for the support of his family, or in indemnifying the person whom he had injured, or in preparing a fund for use after liberation.

Mr. Miller, of the Missouri Penitentiary, says: "The provision in a system of rewards for prisons which I would place second in its power of beneficial influence, would be that which grants to the industrious and well behaved convict a certain share, be the same more or less, of his pecuniary earnings."

Mr. Brockaway says, when he was in charge of the Detroit House of Correction, in 1865, in the administration of discipline rewards are employed as a stimulus to good conduct, viz.: commutation of sentence three days per month, and an allowance for overwork, paid only at the expiration of the sentence. This allowance is a stimulus to industry, and to the cultivation of the habit of application, that will be of service after liberation.

CARDINAL PRINCIPLES IN PENOLOGY.

1. The first is, that the protection of society against criminal spoliation through the reformation of the transgressor, is the primary aim of public punishment. On this point the unanimity appears to be absolute; and the further point that the criminals, especially of the younger class, are capable of reformation by the application of right methods and processes, is daily gaining suffrages.

2. The principle of progressive classification, under which prisoners are advanced from grade to grade, as they earn such promotion, gaining at each advance increased privilege and comfort, is generally admitted in theory, though unfortunately, nowhere, as yet, fully reduced to practice.

3. The principle of rewards, as an incitement to good conduct and reformation, is one on which there is now little dissent. There is also a very general agreement that such rewards should consist of (1), a diminution of sentence; (2), a share in the earnings; (3), a gradual withdrawal of restraint; and (4), a gradual enlargement of privilege.

4. The principle of probationary stages of imprisonment, in which the training shall be more natural, and the genuineness of the prisoner's reformation may be adequately tested, is every day gaining adherents.

5. The necessity for both increasing and systematizing the religious and educational forces of our prisons, is now universally admitted.

6. That all prisoners who have the requisite aptitude, should, through an effective system of industrial training, be put in possession of the power to earn honest bread on their liberation, is a principle which commands universal and unqualified assent.

7. The principle that imprisonment ought to be continued till reformation has been effected, and if that happy consummation is never attained then during the prisoner's natural life, has become a conviction with a large number of American penologists.

8. The growing sentiment in favor of preventive institutions, as the true field of promise in which to labor for the extirpation of crime, is a cheering indication of progress in the right direction.

9. That a higher grade of qualification in prison officers is essential to a successful prison administration, is a point conceded by all,

and the minds of thoughtful men are turned to the further question whether they ought not to have a special education and training for the work.

10. It is now commonly acknowledged that no prison system can be successful, to the broadest and most desirable extent, without some central authority at the helm to give unity and efficiency to the whole prison administration of the State.

There are other important principles on which substantial concord has been reached, but I will not weary the reader with further specifications.

INDETERMINATE SENTENCES.

By indeterminate sentences is meant that all persons in a State who are convicted of crimes or offenses before a competent Court, shall be deemed wards of the State, and shall be committed to a Board of guardians until, in their judgment, they may be returned to society with ordinary safety, and in accord with their own highest welfare. If this principle be adopted, the confinement of a prisoner will depend upon his own exertions to earn promotion and eventual freedom. The duration of confinement is placed under the control, and is determined by the conduct of the convict himself.

Sir Frederick Hill, who obtained great reputation in the successful management of Scottish prisons, said that the chief reliance of a prisoner, above others, is on hope. This secures the hearty coöperation of the prisoners themselves, without which there can be little expectation of real reform, but with which one is pulling with the stream, not against it.

I set a high value on the arrangement in convict prisons, by which it is granted to a prisoner, by great self-control, industry, and exertion for moral improvement, to materially abridge the length of his confinement.

Mr. P. L. Miller, of Missouri, whose experience and observation in prison management has been great, and who ranks high among the masters in this profession, says: "Man's nature is not changed by confinement in prison walls. There, as elsewhere, he is influenced by the hope of good and dread of evil. The hope of reward, of personal benefit in one form or another, is the mainspring of all human effort, whether in regard to the interests of time, or the destinies of eternity."

Reasons for Indeterminate Sentence.

1. It supplants the law of force by the law of love.
2. It secures certainty of restraint and continued treatment, which operate to prevent crime, as severity does not.
3. It makes possible the arrest and right training of that whole brood of beginners before great depravity is reached and character is irretrievably fixed.
4. It utilizes for reformatory ends, the motive that is always the strongest, the desire to be released, the love of liberty.
5. It removes the occasion and so mollifies the feeling of animosity usually felt towards the law and its officers, puts the personal interest of the prisoner plainly in obedience to the rules of discipline, and leads him to coöperate with those laboring for his welfare.

QUALIFICATIONS OF PRISON OFFICERS.

Discipline should rest on personal influence rather than on personal violence; on the power of persuasion rather than of compulsion.

Sir Frederick Hill, Inspector of Scottish Prisons, said: "I attach great importance to the selection and appointment of the officers of a prison. Indeed, its importance is, in my opinion, paramount." Thus said the veteran Inspector of Prisons, who had a long and successful experience, both in Scotland and England. And further, "that no person, unless under very peculiar circumstances, should be appointed a prison officer who is more than forty years old, and that a preference should be given, other things being equal, to persons considerably younger than this." The reason is plain. The science of punishment and the science of moral training, like all other sciences, require a close and special study of these principles. A mastery of these principles is of supreme importance to the formation of a good prison officer. But such a mastery is the work of time and patient application, and requires, to secure it, that flexibility and elasticity of mind which belong to the earlier stages of man's existence. The rigidity of age is unfavorable to new acquisitions in paths before untrodden—more especially on a subject so complex, so subtle, so manifold in its relations, and so profoundly philosophical, as that of prison discipline.

Mr. Brockaway and Louis D. Pilsbury, both most eminent in the management of prisons in America, were trained in penal discipline. General Amos Pilsbury was master of his profession when twenty-five years of age, and was then placed at the head of the Connecticut prison, at Weathersfield, and gained there fame in the government of that and the Albany Penitentiary.

Dr. Wichern,

The German philanthropist, for nearly thirty years held the office of Inspector-General of Prussian Prisons, and established a world-wide reputation for humanity and wisdom in the choice and appointment of Prison Governors and subordinates, well trained for their difficult and arduous work, who were possessed of high personal character and intelligence, and who were especially adapted to their important trusts.

SPECIAL TRAINING.

The Congress of Brussels, in 1846, declared in favor of a special training for the minor service of prisoners. The Congress of Frankfort, in like manner, in 1857, adopted a resolution favoring a "special education of prison officials." The later Congresses of London and Stockholm, each recommended the like education of prison officials. Italy, in 1873, founded a Normal School for the training of prison officers, and at Rome there is an institution for the professional education of prison employés.

We take from the report on prisons and reformatories of the United States and Canada, by E. C. Wines and Theodore Dwight, Commissioners of the Prison Association of New York, made to the Legislature of New York, the following statement of qualifications for prison officers:

1. Prison officers should be men of strict and uniform sobriety.

"Touch not, taste not," should be their rule in regard to all intoxicating drinks.

2. They should be men of mild temper, quiet manners, and pure conversation. If they are passionate and irascible; if they use harsh or petulant language; if they are profane or vulgar in their speech, they are unfit for the place.

3. They should be men of decision and energy. Quick to discern and prompt to act, are qualities equally indispensable with gentleness and equanimity.

4. They should be men of humane and benevolent feelings. When the prisoner enters the prison he feels disgraced, disheartened, and disconsolate. This is the golden opportunity to appeal to his feelings, and to start him in the right direction. The prison officers should be ministers of love and mercy.

5. They should be men having a sincere interest in those placed in their care.

6. They should be men of high moral principle, and distinguished by habits of industry, order, and cleanliness.

7. They should be men possessing a knowledge of human nature in its various aspects and relations.

8. They should be men of sterling and incorruptible honesty.

9. They should be men of experience. This qualification, which is one of prime importance and value, and necessitates two conditions, viz.: an appointment to office before the meridian of life has been passed; and secondly, permanence in the tenure of office.

10. They must be men of a just and steadfast purpose, free from prejudice and partiality.

11. They should be men of untiring vigilance.

12. They should have a liking for their occupation.

13. Finally, prison officers should be men duly impressed with religious principles—men who fear God, and are in the habit, as the expression of that reverence, of attending the services of some religious body.

Mr. Wines says that the need of trained and thoroughly qualified officials is coming daily to be more and more recognized the world over.

The reformation of fallen humanity is a work so complex, delicate, and difficult, demanding qualities of head and heart as high and broad as any ever committed to the hand of man, and as worthy of being raised to a profession as any other in the wide range of human employment.

CLASSIFICATION.

This purpose is largely accomplished by the different grades or classes of penal institutions, such as houses of correction, jails, penitentiaries, and prisons, to which the guilty are sentenced.

But there is an important and useful field for classification in each of the institutions named, and in all such as have reformation in view.

It is self evident that the young offender should be disassociated from the old criminal; that the person who has committed the first offense, perhaps venal, should be separated from the hardened villain; that the comparatively innocent should not be associated with the pronounced guilty. The real classification is one based on character, conduct, and merit, as shown in the daily routine of prison life.

At the Elmira Reformatory, which embraces the best thought and the greatest experience of the most eminent prison managers of America, there are three classes or grades. The convict is received into the middle or second grade. By good conduct he may rise to the first, the highest grade. By misconduct, he descends to the third, the lowest grade. By a perfect record in these particulars, the prisoner may ascend to the first grade, and after having fully established a character for good habits, an application for his liberation can be entertained. The three particulars are:

First—Perfection in his studies.

Second—Perfection in his tasks.

Third—Perfection in his conduct.

Six months perfect conduct in the second grade, without loss of credit marks, entitles one to the right to go up higher to the first grade. Three months perfect conduct in the third or lower grade, entitles one to go up to the second grade.

There is a separate house for each grade. Each grade likewise has a different table and distinctive dress. The condition of the rooms, tables, and dress improves as you advance to the highest grade. Preference is given to the class most improved and most worthy.

The Elmira Reformatory, under the superintendence of Mr. Brockaway, aided by Mr. Louis D. Pilsbury, and other distinguished philanthropists and prison directors, is regarded as the most hopeful institution on this continent. Its system embodies the most advanced ideas of the age, supported by men of great natural endowments, great experience, of great triumphs in prison discipline, and unbounded zeal and ambition in the cause of humanity.

The Crofton System.

The fundamental principle of this system, which has been generally adopted in Ireland, and to some extent in England, is progressive classification. The system has three stages:

1. A penal stage of cellular separation, to be continued eight months; but, by misconduct, may be nine.
2. A reformatory stage, where the progressive principle comes into play of unequal duration, according to the length of the sentence.
3. A probationary stage, to verify the reformatory action of the preceding discipline.

To these should be added a fourth, perhaps, that of conditional liberation, or ticket of leave.

Denmark.

The new prison law creating the progressive system was passed in 1873, and adopts the principles announced at the previous London International Penitentiary Congress in entirety. The principles and methods whereby it proposes to educate their will, to implant in their souls good purposes, and to encourage industry and good conduct, and to train them in beneficial habits, are clearly exhibited in their system.

The whole term of sentence is divided into seven stages, or parts, beside the provisional liberative ticket of leave. Those sentenced to a short term do not pass through all of the seven stages, but are released at different points in the progression.

A table, showing the classification and different stages, may be found on page four hundred and ninety-five of the interesting work of Mr. Wines, on State Prisons and Child Saving Institutions, published by the University Press, Cambridge, 1880.

TRANSPORTATION OF PRISONERS.

This work can be most effectively and economically done by the Wardens, or such prison officers as the Wardens shall depute. This is the system now adopted at the Elmira Reformatory, New York. This institution is under the government of a Board of Trustees, at the head of which is Louis D. Pilsbury, with Mr. Brockaway for its Superintendent, and they have endeavored to make it the model reformatory in every respect. Their reputation and successes are a guarantee for the most flattering expectations.

Massachusetts, Connecticut, and Maine have practiced this system with the most gratifying results. The cost of transportation is reduced more than one half in the last three named States, without experiencing any inconvenience or evil from the system.

HOUSES OF CORRECTION AND JAILS.

Our County Jail system is defective in two important respects:

1. No provisions are made for the labor of the inmates, so essential for their health, for their support, and for their reformation. Idleness reigns and consequent vice prevails in every County Jail in this State.

2. Our jails are so constructed that there is an unavoidable promiscuous association of the young and the old, the convicted and the unconvicted, the hardened villain and the novice in crime.

There are two methods of correcting these glaring evils:

First—By county workhouses, as in Massachusetts.

Second—By district houses of correction, or penitentiaries, as in New York, sometimes called district prisons. The district houses of correction should be under the control of the State, and those committed should be cases where the sentences would be from a few days to a limited number of years. The number committed to any one institution should be sufficient for profitable employment and effective discipline, and not so large as to obstruct these ends.

New York has six district penitentiaries, which are work houses and houses of correction, to which about twenty thousand are committed annually, with a daily average of about four thousand, under sentences from a few days to ten years, with which are connected workshops, where the various trades and industries are carried on, the same as in the Massachusetts jails.

Massachusetts had, in 1872, eighteen jails and sixteen workhouses, called Houses of Correction, in her fourteen counties. The jails were used for detention before trial, and the Houses of Correction for work after conviction. Fourteen jails and Houses of Correction were under the same roof and the same management. In the largest, in 1872, the profits were seven thousand seven hundred and thirty-three dollars.

Mr. Brockaway says the iniquitous common jail system must be stricken from the face of society, and some safe place be provided in each county for isolated imprisonment of alleged criminals before trial, and also district industrial reformatories *for the treatment* of those convicted of misdemeanors and fallen persons, and those guilty of the lesser grades of crime.

The methods of practice and condition of our jail and police system are so well described by the Rev. F. H. Wines, Secretary of the Board of Public Charities of the State of Illinois, that I cheerfully insert it:

> There is an hourly intercourse of prisoners with each other and the lack of every useful and honorable employment. It is this association which is the curse and condemnation of our present jail system. The effect of association is to increase the number of prisoners and develop their criminality. The innocent and comparatively innocent are corrupted by the example, the conversation, and the direct teaching of the more experienced transgressor. The lessons taught in County Jails are contempt for authority, human and divine; hostility to law and its officers; the delights of vicious indulgence; the duty of revenge upon society for imaginary wrongs; the necessity of violence, of daring, and of sullen submission to punishment; the hopelessness of all efforts at amendment, and the best methods of success in criminal undertakings. Past exploits are here recounted; future deeds of darkness are here planned; the history and character of noted criminals and of well known officials are here discussed. Lewd songs and conversation, profanity and ribald jests fill the day. In many jails card playing is freely allowed. In a few liquor is not absolutely prohibited, providing that the prisoner ordering is able to pay for the indulgence. Every jail is a school of vice. Near one hundred of such schools are maintained in the State at public expense, and the public furnish an education in crime at its own cost, annually, to hundreds of criminals. But the evils of promiscuous association are enhanced by the universal reign of idleness in county prisons; this idleness is compulsory, it is a necessity of the situation. The State appoints as the presiding genius loci, the mother of all villainy, instead of labor, the mother of every virtue. No policy could be more short-sighted. Idleness in prison is a premium on crime. Multitudes of men commit offenses every Autumn simply to secure, free of cost to themselves, comfortable board and lodging, with agreeable company, through the Winter months. They do not dread confinement and care nothing for disgrace. In enforcing idleness the State voluntarily relinquishes the most effective means, both of the punishment and prevention of crime. What makes men criminals? In nine cases out of ten it is aversion to labor, and the conviction that a life of crime is easier and fuller of enjoyment than a life of industry. Make labor compulsory in all prisons, and the prison at once becomes a terror to evil doers. Confinement at hard labor is, to the majority of criminals, the severest possible punishment, but the present system ignores this most obvious truth.
>
> The physical and moral effect of protracted idleness upon individuals is deterioration. The muscles become flaccid, the nervous system loses its tone, the will is enfeebled, the moral nature depraved, and at the expiration of his imprisonment the offender goes forth to recommence his criminal career, with his power to earn an honest livelihood and resist temptation diminished instead of augmented.

THE UTILITY AND NECESSITY FOR JUVENILE INDUSTRIAL SCHOOLS.

What provisions are now made to save the homeless, destitute, neglected, and vicious children from the first fall; or, if they have fallen, to lift them up again and rescue them from a criminal career? We are answered, the common schools. These, like normal schools, academies, colleges, and universities, are excellent, and subserve most useful and beneficial purposes.

Common Schools.

Pray tell of what use, practically, common schools are to the ragged, vicious, and incorrigible boys on the wharves, and in all the purlieus of our great and small towns, who never enter their sacred apartments? It may be answered that they have an opportunity to attend schools, and therefore the fault and misfortune are theirs.

In this matter the community has an interest; they form a part thereof, and their faults and crimes affect every interest and every member of society, and become the misfortune of society itself.

Neither logic nor sophistry will alter the facts, that *over fifty thousand* of our youths in this State, between the ages of five and seventeen, last year did not cross the threshold of any institution of learning. It is a startling fact that there is an army of youth in the State who are being educated in dens of vice and trained in a criminal course, whom our school system does not reach. Public sentiment and law do not authorize or warrant the police in arresting and placing in a cell every truant and idle youth, as they once did in Aberdeen, Scotland. The State is spending money with a lavish hand, about three million dollars annually, on the one hundred and fifty thousand good boys. Why not devote a little, if necessary, some of the three million dollars, to the reclaiming of

Our Fifty Thousand Wandering Boys,

And make them good, too, and useful children of the State? Doth not the Scriptural inquiry and doctrine apply here with undiminished force? "How think ye? If a man hath an hundred sheep and one of them be gone astray, doth he not leave the ninety and nine and goeth into the mountains and seeketh that which is gone astray?" And why should not society and the State gather up its erring, wandering children, and protect them, and shield them in the great fold of humanity, encompassed by charity, love, and law, and make them useful citizens of this great republic?

As a work of mercy and necessity, to gather up the neglected, the destitute, and the vicious, and arrest their career, there have been established in the City of New York forty-four associations.

France has fifty Juvenile Reformatories established under the law of 1850, modeled after the institution founded by Demetz, at Mettray, nearly half a century ago.

Germany had, in 1867, seventy-nine Juvenile Reformatories. The first was established by Doctor Wichem as early as 1833, at Rauhe Haus, near Hamburg. There had then been committed to the institution ten thousand five hundred and twenty-seven youths, of whom seven thousand two hundred and twenty-three had been discharged. After the closest scrutiny it was ascertained that of those discharged, only three hundred and thirty-nine—a little over four per cent.—had relapsed and entered upon a criminal course of life.

England has two systems for delinquent juvenile treatment. One is a reformatory school of a curative character; the other is an industrial school for the prevention of crime; and together they cover the whole field of delinquent juvenile treatment. These schools are established under a general law authorizing private citizens to found such schools whenever and wherever in their judgment they are needed. When ready for occupancy, these establishments are examined, and if found suitable, with all the necessary grounds and buildings certified by a government inspector, and a certificate is given to the founder which entitles the institution to government support for each inmate received and cared for. In these institutions elementary, scholastic, and industrial instruction is given. There are about two hundred schools of the character above described in England, and the results have been most encouraging. In some localities it has cut up juvenile vagrancy by the roots, and nearly annihilated juvenile crime, and everywhere it has broken up the combination of youthful thieves and depredators, which previously had been such a menace and peril to society.

Massachusetts has her "Truant Schools," her State Primary School for the prevention of crime, with about five hundred inmates, and three State Juvenile Reformatories, in which there are about one thousand delinquent youths.

In all of the Eastern, Northern, and Western States, in addition to the common schools, there are established a class of scholastic, disciplinary, and industrial schools, to prevent and remedy juvenile viciousness and depravity, and save this class of youths from a life of crime, and community from violence and spoliation.

Industrial juvenile schools are one of the necessary links in the system of preventing crime, and one of the leading and important agencies.

Institutions of this class are to gather up the children of parents who neglect their offspring, either because they are intemperate or vicious, or indifferent to their welfare; children who roam the streets, prowl about docks and wharves, and those who from neglect and association are almost sure to take up crime for a trade, and to impart to such mental, moral, and industrial training which their own homes do not offer them.

Mr. Z. R Brockaway says: "The seeds of much degradation and the source of much criminality are found in neglected children, in the children and youth in jails, in almshouses, and in dependent families."

THE EXTENT OF CRIME.

When we contemplate the extent of crime, vagabondism, pauperism, and the great army of youths budding and blossoming in ignorance and vice, we are alarmed at the prospect, and anxiously cast about for some remedy. The great receptacles of criminals are supplied from the youths of the land.

Maxims.

Cut off this supply and we will not need any prisons.

If we repress viciousness in youth, we will prevent criminality in age.

If we instill habits of industry in the young, the result will be competency in age.

Discipline and culture in trade, arts, books, and labor in youth, are antidotes to pauperism, vagrancy, and criminality, will reform the erring, and check the beginning of crime.

As the twig is bent the tree is inclined, is a maxim applicable to human life.

That an ounce of prevention is worth a pound of cure is true in this case.

Purify the springs or the streams will be infected, check the vicious taste and the wayward course before they ripen into criminality.

SCHOOL OF INDUSTRY.

In accordance with the principles and practices above enunciated, Assembly Bill No. 439, entitled "An Act to establish a State School of Industry and to provide for the organization and government thereof," was introduced on the fourth of February, 1881, but was not considered for the want of time.

This bill provides for the establishment and management of a State School of Industry by the State Board of Education, consisting of the Governor, the Superintendent of Public Instruction, and the Principal of the State Normal School.

2. For the purchase of not less than one hundred acres of land and the location of the institution in a central place, easy of access from all parts of the State.

3. For the appointment of a Superintendent and officers schooled, endowed, and qualified for the particular work, in accordance with the best methods of penology.

4. For classification and discipline in accordance with the system established by Messrs. Pilsbury, Brockaway, and other eminent men, at Elmira, New York, as prescribed in section eight of the bill, as follows:

Sec. 8. The inmates shall be divided into three grades or classes. On entering the institution they shall be received into the middle or second grade. By good conduct—that is, perfection in studies, in tasks, and in deportment—for six months, they shall be promoted to the first grade; by misconduct they may be reduced to the third grade. Three months' perfection in the third grade shall secure admission to the second grade. None but those of the first grade can, from time to time, be paroled or released. The standing shall be determined by a system of marks, indicating merits and demerits, and each inmate shall be furnished with a pass-book, in which shall be entered weekly a transcript of his conduct. If any one considers his account unjust, he may appeal to the Superintendent or the Board for its correction. Each grade shall have a separate building, a separate table, distinctive uniform, and differently furnished rooms. Privileges shall be given according to grade, the first having the preference.

5. For the detaining and employing of those committed to this institution, as provided in sections eleven and twelve:

Sec. 11. The said Board shall have power to detain in this school, subject to the rules and regulations thereof, all persons placed in the same, until they attain the age of twenty-one years, or they shall be proficient in their industrial education; to conditionally or absolutely release from custody or control in the institution, or other custody or control, on showing evidence of good character, and power to resume such control and custody, wholly or in part, aud to recommit to said school at any time prior to absolute release.

Sec. 12. The inmates of the institution shall be taught agricultural labor or mechanical industries, or both, for the purposes of instruction, profit, and formation of character, and so far as is possible shall be taught such trades and industries as may be useful to them after their discharge from the institution. A school shall be organized in the institution with a prescribed course of studies and fixed terms, and there shall be taught therein reading, writing, spelling, arithmetic, United States history, elements of civil government, mental and moral philosophy, and such other studies as are deemed best.

6. For the committal of vicious and disobedient boys, on application of parents and guardians, they paying for their board and tuition, and otherwise as provided in sections fifteen and sixteen:

Sec. 15. Whenever said institution shall have been so far completed as to properly admit of the reception of boys, the Governor shall make due proclamation of that fact, and thereafter it shall be lawful for said Board to receive into the institution boys under the age of eighteen years, committed to their custody in either of the following modes, to wit:

First—Boys may be committed to said institution by a Judge of the Superior Court of the county wherein such boys complained of reside, on the complaint of the parent, friend, or guardian of such boy, and on its being proven to said Judge that, by reason of vicious, disobedient, or criminal conduct, such boy is beyond the control of such parent or guardian, or that it is manifestly requisite for the future welfare of such boy, or that the good of society demands that he should be placed in said institution.

Second—Boys may be committed by such Superior Court Judge, when complaint and due proof have been made that such boy is a proper subject to be committed to said institution, in consequence of vagrancy, or of vicious or criminal conduct, or when it shall appear that from the depravity or neglect of the parent or guardian in whose custody such boy may be, it is necessary for the protection of society, or the prevention of crime.

Sec. 16. Any boy under the age of eighteen years who shall, under the laws of this State, be liable to confinement in any prison of this State, may, at the discretion of the Court trying the case, be placed in said institution until the age of twenty-one years; *provided*, that any such boy may be discharged at any time before attaining the age of twenty-one years on the same conditions as other boys are discharged, under the rules and regulations of said Board; *provided further*, that such boy may, by order of the Board, be remanded to the Court for trial.

The amount of good that may be produced by such an institution, under proper management, in efficient hands, is beyond calculation, both to the State and its citizens. The amount of sorrow, and wretchedness, and anguish that may be avoided through the beneficial work of such an institution, is simply indescribable.

ILLUSTRATIONS.

A Widow's Son.

A short time ago, in this city, a lady with careworn and pallid face and nerveless step, was waiting on a boarding house table. The question was asked, why is that countenance marked with so many and deep traces of sorrow? The reply came, she is a widow and a mother, and while she was engaged in providing bread and clothing for her family, her son run on the street, mingled with bad boys, became vicious and uncontrollable, was frequently arrested on petty charges by the police, and about a month ago was convicted of larceny and sent to prison. The disobedience of the son has been a source of inexpressible anguish; her life has been a wreck; her darling son is a culprit, in prison, lost to both the mother and community. Had a Reformatory been established, under the charge of some Brockaway; could she have invoked the provisions of this bill for protection and relief; had the State have stretched out its strong arm and rescued her boy, what pen can picture, what tongue can express, the change of her life from sorrow, from anguish, from hell, to a happy home, with all that the words happy home imply?

The Professional Gentleman's Son.

Here is a professional gentleman, pursuing his calling without relaxation, ambitious to acquire competency, wealth, and distinction. The wife also may have been too much engrossed in domestic duties, or, as more frequently happens, she may have been drawn into the giddy whirl of fashionable life, or have been wasting her precious time in places of amusement, while the son, neglected, is visiting houses of dissipation and forming habits that lead to ruin and death. This course continues on the part of both parents and child, without a suspicion of the terrible result, until some excess or delinquency of the son is brought to the notice of the parents that requires attention. An attempt is made to check the wayward course. Persuasion and reproof are tried, but, to the utter dismay of the parents, in vain. The contest for salvation begins in earnest, but it is too late. The devil, with his destructive artillery, whisky saloons, gambling saloons, wicked associates, and dens of vice, has the mastery. The son, under these malign influences, is defiant and incorrigible. Tears and prayers are of no avail. The darling boy passes rapidly from the control of the parents to the control of the Prison Warden, and his fate is sealed, and the parents' grief and anguish inconsolable and unavailing.

It needs the power of the State, through the benign influences of such an institution as we have described, in the hands of a Christian master, to remove the tempted and falling from the haunts of vice, from the scenes and places of temptation, and thus rescue them from a life of crime.

C. HARTSON,
Chairman of the State Prison Committee.

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JOINT REPORT

OF THE

COMMITTEES OF THE SENATE AND ASSEMBLY

ON THE

ASYLUMS FOR THE INSANE.

REPORT.

Mr. President: The Committee on State Hospitals and Asylums respectfully submit the following supplementary report:

Visiting the Asylums for the Insane at Napa and Stockton we find the number of insane restrained therein to be:

	Males.	Females.	Totals.
At Napa, December 31, 1880	596	341	937
At Stockton, December 31, 1880	781	326	1,107
Total at Napa and Stockton			2,044

The increase of patients during the fiscal year ending June 30, 1880, to be one hundred and fourteen, and the increase for the last six months ending December 31, 1880, to be eighty-nine.

The movement of the patients for the period last named are as follows:

NAPA.

	Males.	Females.	Totals.
Number July 1, 1880	536	303	839
Admitted from July 1 to December 31	185	91	276
	721	394	1,115
Discharged	87	39	126
Died	36	14	50
Eloped	2		2
	125	53	178
Remaining December 31, 1880	596	341	937

STOCKTON.

	Males.	Females.	Totals.
Number of patients, July 1, 1880	790	326	1,116
Number admitted during the six months ending with December 31, 1880	49	10	59
Number under care and treatment	839	336	1,175
Number discharged, recovered	19	4	23
Number discharged, improved	4		4
Number died	34	6	40
Number escaped	1		1
Discharged, died, and eloped	58	10	68
Number remaining January 1, 1881	781	326	1,107

The management, as heretofore reported, is conducted with all due economy, and for the best interests of the patients and the State. Comment in this respect is unnecessary at the present. The improvements deemed necessary are stated in detail in the Superintendents' reports. An increased supply of water is absolutely necessary for the Napa Asylum.

The Asylum at Stockton is already filled to its capacity, and the new building in course of erection will not increase the accommodation; being calculated to take the place of the condemned wards. The Asylum at Napa can be made to accommodate in total, after all the contemplated improvements are completed, about two hundred patients in addition to the present number. It is evident, from the continued increase of the insane, provision will have to be made, at the next session of the Legislature, to meet their requirements.

We would suggest the present accommodations will be sufficient for the acute cases of insanity, for at least eight years to come, provided there be removed therefrom a portion of the chronic insane, demented, and epileptic, equal to twenty-five per cent. of the whole number of insane, and there be provided for them inexpensive buildings, erected on land suitable for cultivation, whereby they may earn a portion of the sum necessary for their support.

Of the supposed causes of insanity, as stated in the commitments of six hundred and eighty-six patients the last year, intemperance is assigned as that of forty-three; domestic and business troubles, of thirty-five; epilepsy, forty. All of the above might really be charged to intemperance. It is the conclusion of the physicians in charge, fully one half the cases of insanity are attributed to dissipation in some form; one half of the remainder to heredity, and the balance to various causes. The majority of the insane, now restrained in the asylum, were not originally possessed of bright minds, and are of the lower classes. The statistics of the asylum demonstrate the fact, those of foreign birth that have been admitted therein, bear the proportion of two to one, and the increase of insanity has kept steady pace with that of immigration.

In fact, the increase of insanity in this State, and throughout the United States, is alarming, and challenges the attention of every intelligent mind. It is not sufficient the approximate causes thereof should be represented from year to year in our reports, but we must diligently inquire after and determine absolutely the facts; then, as it is the part of a physician attending a patient not only to alleviate the suffering, but eradicate the disease, so may the State, whilst caring for its insane, determine the causes which fill her asylums, and modifying them, not only will the burden of their support be lessened, but humanity correspondingly benefited.

In this connection, we append extracts from a report of the State Board of Charities of New York:

> The observations and investigations of this Board have clearly established the conclusion that it has long been the practice of many of the cities and towns of different governments of Europe, to send to this country their blind, idiotic, crippled, epileptic, lunatic, and other infirm paupers incapable of supporting themselves, in order thereby to avoid the burden of their support. To such an extent has this practice of sending confirmed helpless paupers to America increased, that it cannot be denied, indeed, little or no attempt at denial or concealment in the matter is made, and the fact of their fraudulent shipment to this country has been fully established. The matter has been brought to the notice of the proper authorities of other States, and has everywhere attracted marked attention. The classes referred to are in nowise the legitimate objects of our charity, and the State ought not to be burdened with their support; on the contrary, the task of supporting them should be thrown upon the countries in which they originate.

Investigation alone can determine how many of this class are in our asylums. Our gates are open to the world, and we have patients from nearly every State and clime. Within the last year we have had committed four Mexicans who were landed in this State for apparently the express purpose of their being committed to the asylums. We have also had committed the past year twenty-four Chinamen. Most certainly this class of people should be sent back to the countries of their origin, and where others have not gained a residence, means should be provided whereby they could be sent to their relatives, or the States or countries from whence they came. We wish not to withhold the hand of charity, but in its practice to be just and wise.

As immigration seriously affects the increase of insanity, it is proper to allude to it here. Intervening no obstacle to the tide of voluntary immigration, it ought to be sifted to the objectionable classes referred to in the above. Nor do we think glowing accounts of the country, too often imaginary, should be permitted to be circulated abroad in the interest, as it is, of holders of large tracts of land and speculators, to unduly excite and encourage immigration; but that it should be fostered only to the extent that we can readily assimilate it to the condition of our country and institutions, rather than overtax this generation in the provisions of charity, and rob the next of its birthright.

CONTRACT PRICES

Of supplies furnished at the Asylums for the Insane, at Napa and Stockton, and by whom, for the six months ending April 30, 1881.

	Stockton	Napa.
FLOUR, BRAN, ETC.		
Stockton—Sperry & Co.:		
Napa—W. R. Cooper:		
Flour, Bakers' Extra, per 100 ℔s.	$2 25	$2 45
Flour, Graham, per 100 ℔s.	2 25	2 25
Cracked wheat, per 100 ℔s.	2 50	2 50
Corn meal, per 100 ℔s.	1 50	1 65
Ground barley, per 100 ℔s.	1 00	1 00
Bran, per 100 ℔s.	65	75
Oat meal, per 100 ℔s.	--------	3 60
BEEF AND MUTTON.		
Stockton—Louis Gerback:		
Napa—Zolner & Eren:		
Fresh beef, per 100 ℔s.	$4 50	$7 26
Fresh mutton, per 100 ℔s.	4 50	7 26
FRESH RANCH BUTTER.		
Stockton—R. Haight & Co., per ℔.	27½	--------
Napa—R. Haight & Co., per ℔.	--------	27½
Firkin butter, per ℔.	--------	24
DRY GOODS:		
Stockton—E. R. Stockwell:		
Napa—Thompson & Beard:		
Pemberton AA ticking, per yard	--------	14½
Utica unbleached, per yard	18	18½
Lacoma bleached sheeting, per yard	--------	20½
Pequot, per yard	17	15½
Caledonia check, per yard	--------	16
Table linen, per yard	--------	55
Russia crash, per yard	--------	10
Indian Head, 4-4, per yard	9½	8¾
Gray twilled flannel, per yard	--------	22½

CONTRACT PRICES—Continued.

	Stockton.	Napa.
York check, per yard		12½
Rubber sheeting, per yard		75
Calico, per yard		6½
Amoskeag ginghams, per yard		10½
Huck towels, per dozen		1 62½
Colored spreads, per dozen		10 50
BEDDING.		
Napa—Mueer & Sons:		
Feathers, per ℔.		64
Curled hair, per ℔.		44
Straight hair mattresses, each		9 50
POTATOES.		
Stockton—O'Connor Bro., per 100 ℔s.	84	
Napa—A. Hatt, per 100 ℔s.		85
COAL.		
Stockton—Black Diamond Coal Co., per ton of 2,240 ℔s.	$7 00	
Napa—J. McCudden, per ton (Sydney)		$11 75
GROCERIES AND PROVISIONS.		
Sandwich Island sugar, per ℔.	7¾	8½
G. C. sugar, per ℔.	10½	10¼
Fine crushed sugar, per ℔.	12¼	11¾
Coffee, Costa Rica, per ℔.	14½	15
Coffee, Java, per ℔.		24
Black tea, per ℔.	11	15½
Japan tea, per ℔.	28	30½
Dairy salt, per ℔.	1½	¾
Chemical Olive soap, per 100 ℔s.	$4 00	$4 00
Starch, per ℔.	7	8
Bayo beans, per ℔.	1⅛	1 05
China rice, per ℔.	4¾	5
California lard, per ℔.	10	10½
Concentrated lye, per ℔.	4⅛	
Sandwich Island syrup, per gallon	22	28
Golden syrup, per gallon	62½	62½
Wine vinegar, per gallon	15	20
Black pepper, per ℔.	12	
Mustard, per ℔.	12	
Ginger, per ℔.	11	
Allspice, per ℔.	11	
Bicarb. soda, per ℔.	5	
W. S. lard oil, per gallon		82½
Sal soda, per ℔.	1¾	2
Mixed pickles, per gallon		40
Straw paper, per ream	70	
Eggs, per dozen		25
Blue Point oysters, per dozen	2 37½	
Macaroni, per box		85
Bath brick, per dozen	75	
California river salmon, per dozen	3 50	4 00
Codfish, per hundred	5 00	
California brooms, per dozen	1 90	2 00
Firkin butter, per ℔.	21½	
Soda crackers, per ℔.		5½
Whittaker hams, per ℔.		14½
Fine cut tobacco, per gross	9 29	
Dark navy tobacco, per ℔.	37	42½
CLOTHING.		
Stockton—E. R. Stockwell:		
Napa—Thompson & Beard:		
Wool overshirts, per dozen	$12 00	$7 75
Hickory shirts, per dozen	5 50	4 50
Germantown socks (woolen, Stockton), per dozen	1 35	1 10

CONTRACT PRICES—Continued.

	Stockton.	Napa.
Satinet pants, per dozen	15 00	17 50
Satinet coats, per dozen	35 00	40 00
Made duck overalls, per dozen	11 50	-------
Ladies' wool hose, per dozen	1 75	1 50
Wool hats, per dozen	5 50	5 50
SHOES.		
Stockton—Fred. Arnold:		
Napa—Thompson & Beard:		
Men's slippers, per dozen	$8 00	$5 00
Ladies' slippers, per dozen	-------	5 00
Brogans, per dozen	12 00	13 50
Ladies' buskins, per dozen	6 50	-------
Carpet slippers, per dozen	6 50	-------
GRAY BLANKETS.		
Stockton—Ed. Huckman, per pair	$3 45	-------
Napa—Thompson & Beard, per pair		4 10
FURNITURE.		
Napa—Truman S. Clark:		
Iron bedsteads, each		7 92
Rawhide chairs, per dozen		13 50
Cane seat chairs, per dozen		16 00

Prices average higher at Napa than Stockton.

PAYROLL.

State Insane Asylum, Stockton, California, January, 1881.

One Medical Superintendent	$291 66
Two Assistant Physicians, $208 33	416 67
One Secretary	150 00
One Steward	100 00
One Steward's Clerk	60 00
One Storekeeper	60 00
One Apothecary	75 00
One Supervisor	75 00
Twelve Attendants, male department, $50	600 00
Fifteen Assistant Attendants, male department, $40	600 00
One Assistant Attendant, male department	25 00
Two Watchmen, $60	120 00
One Watchman, outside	40 00
One Porter	30 00
One Gardener	75 00
Four Garden hands, $40	160 00
One Laundryman	50 00
One Shoemaker and Tailor	70 00
One Carpenter	75 00
One Engineer-in-Chief	100 00
One Engineer's Assistant	25 00
One Engineer, female department	60 00
One Engineer, farm	40 00
One Coachman	35 00
One Teamster	40 00
One Baker	65 00
One Assistant Baker	40 00
Two Cooks, $60	120 00
Five Assistant Cooks, $40	200 00
One Waiter	40 00
One Matron, female department	75 00
Thirty-two Attendants, $40	1,280 00
Two Watchwomen, $40	80 00
Amount carried forward	$5,273 33

Amount brought forward	$5,273 33
One Portress	40 00
One Seamstress	40 00
One Laundress	40 00
One Waitress	30 00
One Cook, Medical Superintendent's residence	25 00
One Maid, Medical Superintendent's residence	10 00
Total	$5,458 33

Number of Officers and Employés on the Payroll of the Napa State Asylum for the Insane, January 1, 1881, *and the salary paid each.*

One Resident Physician	$250 00
Two Assistant Physicians	166 66
One Secretary	100 00
One Steward	150 00
One Supervisor	75 00
One Supervisoress	50 00
One Treasurer, Board of Trustees	50 00
One Steward's Clerk	75 00
One Matron	50 00
One Carpenter	90 00
One Engineer	100 00
One Druggist	75 00
One Seamstress	40 00
Twenty-seven Attendants	45 00
One Attendant and Laundress	50 00
Twenty-five Assistant Attendants	35 00
Two Assistant Attendants	25 00
One Assistant Attendant	40 00
One Assistant Attendant	45 00
One Night Watch	50 00
Two Night Watch	45 00
One Watchman	40 00
One Messenger and Usher	40 00
One Cook	95 00
Two Cooks	50 00
One Cook	40 00
One Baker	60 00
One Baker	35 00
One Laundryman	60 00
One Ironer	20 00
One Fireman and Pipe-fitter	60 00
One Fireman	50 00
One Gardener	45 00
One Landscape Gardener	75 00
One Laborer	25 00
Two Laborers	35 00
One Laborer	20 00
One Laborer, patient	20 00
Four Laborers, patients	10 00
Two Waiters	30 00
One Waitress	15 00
One Porter	30 00
Total	$4,666 66

R. M. LAMPSON, Chairman,
ROWELL,
HUDSON,
GORMAN,
ANDERSON,
Senate Committee.

OSCAR LEWIS, Chairman,
MAY,
CRUMPTON,
LEAKE,
MATHEWS,
Assembly Committee.

MEMORIAL

OF THE

Regents of the University of California.

MEMORIAL.

UNIVERSITY OF CALIFORNIA, BERKELEY,
December 31, 1880.

To the honorable the Senate of the State of California:

The undersigned, Regents of the University of California, in behalf of the Board of Regents, and in pursuance of the requirements of the law, hereby make known to you the wants of the University.

The Regents respectfully ask your favorable attention to the following:

First—For furnishing the Bacon Art and Library building with the necessary bookcases, desks, chairs, tables, shelving, heating apparatus, etc., twenty thousand dollars.

Second—For grading, draining, and otherwise improving the grounds in the immediate vicinity of the building, five thousand dollars.

Third—For continuing the special investigations and operations of the Agricultural Department, ten thousand dollars.

Fourth—For the Mechanical and Mining Colleges, to continue the operations of and to advance the instruction in said colleges, ten thousand dollars.

In asking for the above appropriations, aggregating forty-five thousand dollars, the Regents respectfully call attention to the fact that the greater part thereof is required for materials and improvements of a permanent character, while the remainder is to be expended in the departments named for investigations and instruction of such a character as to be of great economic importance and practical value to the people of the State.

Respectfully submitted.

JOS. W. WINANS,
A. L. RHODES,
B. B. REDDING,
A. S. HALLIDIE,
J. WEST MARTIN,
HORATIO STEBBINS,
WM. ASHBURNER.

REPORT

OF THE

SENATE COMMITTEE ON STATE PRISONS.

REPORT.

Mr. President: Your Committee on State Prisons respectfully beg leave to report the following in reference to those institutions:

The committee, consisting of Watson, Sears, Moreland, Cheney, Neumann, Enos, and Brown, on January twenty-third, visited San Quentin and made a somewhat extensive examination of the buildings, grounds, and management of the same.

On January thirtieth the committee also visited the the prison at Folsom.

At San Quentin the majority of the committee remained two days, and at Folsom one day.

The buildings, grounds, and guard houses at the former place were found to be in complete order, and the entire management of the same, so far as the committee could discover, is good. The discipline is firm though not severe, and not a complaint was made by the large number of prisoners who were invited to make known their grievances, if they had any.

Many marked improvements have been made by the present management, both in the manner of treating prisoners and in the construction of buildings for the use of those in charge—a detailed statement of which can be found in the report of the Directors for the current year.

The roadway leading from the ferry landing to the prison has been macadamized; new water pipes have been laid for the better protection of the buildings and workshops from fire.

A substantial brick guard house, two stories high, conveniently cut up into apartments for the use of the guards and officers, has been built at the entrance of the prison grounds.

The walks have been graded and improved. Three residences have been erected for the Clerk, Resident Physician, and Commissary; the grounds and prison yards have been lighted with gas; the buildings and prison cells have been painted; iron bedsteads have been substituted for the wooden ones heretofore in use, nearly all of which improvements have been made by convicts, thereby giving employment to the prisoners, and largely adding to the value of the property of the State.

The great need of the prison is more room. With the present conveniences it is impossible to separate the hardened criminals from the younger offenders. Nor can men be kept separate while in confinement, when there are not cells enough for one half of them.

Plots for escape and mutiny after escape, are always concocted by prisoners when locked up together. There should, at the earliest time, be another yard, with cell buildings erected, for the purpose of properly grading the prisoners according to crime and mental characteristics. There are several young boys now confined there who ought to be in a reformatory school, or under the guardianship of some one who would put them to some useful employment.

The committee found these youths receiving the best possible treatment under the circumstances. The school room is a model of neatness, and the instructor evinces the kindest interest in their promotion and welfare.

The hospital is under able management. The Resident Physician, Dr. Cary, has succeeded in bringing about a better physical condition among the convicts; and the wards are as well kept as those in any private hospital. There were but few patients found there by your committee, which speaks well for the sanitary condition of the prison. To the mild climate, the abundant supply of pure water, the excellent system of drainage, as well as to the management, is this due.

The Directors have devoted much of their time since their appointment to attending to the business of the prison, and perfecting plans for the future employment of the convicts. This service has been rendered gratuitously on their part, the law allowing only their mileage in going to and from the prisons to their homes, which are, in the case of three of them, long distances from the prisons. Their services, in the opinion of your committee, are as valuable, and their duties as arduous, as any other commission in the State, many of which are paid liberal salaries. The commission is deserving the sincere thanks of the entire people of the State for their active work and efficient management thus far.

The Warden has exhibited marked fitness for the position, and the prison under his supervision will certainly be well taken care of, while the prisoners are receiving such treatment as will naturally tend to their well-being and moral improvement.

The Folsom Prison was in an unfinished condition when the Board of Directors went into office. Improvements there, by way of preparing for occupancy, were so far completed on July sixteenth that the Directors ordered as many prisoners transferred from San Quentin as could be worked with safety; and with their labor the work of improvement has been carried on until everything about the prison building is now in very good condition.

As yet there is no wall surrounding the yard, and convicts are only prevented from escape by the vigilance of the officers in charge.

An appropriation of twenty thousand dollars is asked to complete the walls, and that it should be granted at once needs no argument from your committee.

The amount of work done by convicts since being transferred there is a matter deserving the highest commendation. The Warden has succeeded in maintaining perfect discipline, and has also succeeded in preventing any escapes, notwithstanding the temptations to attempt escape have been great in consequence of the want of walls, etc.

With the completion of the improvements contemplated there, it will be easier and cheaper to guard prisoners, and many changes for the better can be made in their management.

The first consideration with the Directors has been to provide means whereby the convicts at both places can be profitably employed. Their plans are fully set forth in their annual report, and your committee is disposed to agree with their plans, and recommend the appropriation necessary to carry them into successful operation.

B. J. WATSON, Chairman.

MEMORIAL

OF THE

SAN FRANCISCO BAKERS' VEREIN

MEMORIAL.

San Francisco, January 10, 1881.

To the honorable Senate of the State of California, in session at the Capitol, at the City of Sacramento:

The undersigned, officers of the "San Francisco Bakers' Verein," an association duly incorporated under the laws of the State of California for the past three years, respectfully represent to the honorable Senate:

First—That most of the bakehouses in this City and County of San Francisco are unfit for the uses and purposes, and detrimental to the lives and health of the journeymen bakers.

Second—That most of the working-rooms are in low basements, sunless, and poorly ventilated; that the continuous strain upon the nervous system by sixteen to eighteen hours work per day, averaging about fifteen hours per day for the seven days of the week, is more than a match for the strength of the average workman, who becomes prematurely old and, practically, often unfit to discharge the onerous duties of their calling; that this continuous strain not only undermines the constitution of the average baker, but it makes him a comparative stranger to his family, having no day of rest or recreation, social, intellectual, or religious culture.

Third—The Supreme Court of this State having declared "An Act to regulate and provide for a day of rest in certain cases," passed by the last Legislature, and approved by the Governor on the 15th day of April, 1880, unconstitutional, as being of a nature of special legislation, a copy of said decision of the Supreme Court is herewith annexed.

Therefore, your petitioners most respectfully, earnestly, but humbly, pray your honorable Senate to grant us a commission from your honorable Senate, to examine into and report, at this session of your honorable Senate, for such relief, or a statute law as will protect our lives and health, to which we are entitled, as freemen and citizens, by the laws of Nature and of Nature's God, and looking to a just God for the rectitude of our purposes, and to a just and equal legislation of a sovereign State of the great family of States of the great American Union of States, your humble petitioners will ever pray.

WILLIAM ROTERMUND, President,
LOUIS REICHARDT, Secretary,
San Francisco Bakers' Verein.

Indorsed by the Bakers' Union of California.

JOSEPH GEORGE MYSELL, Secretary.

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